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# Artificial Intelligence

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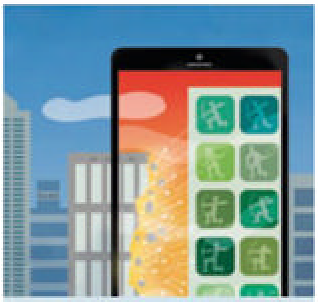

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## Politics

Eric Chu, the chairman of **Taiwan's** ruling party, the Kuomintang (KMT), held talks with the general secretary of **China's** Communist Party, President Xi Jinping, in Beijing. It was the first meeting between the two parties' leaders in six years. China is worried that the KMT, which favours closer ties between Taiwan and the mainland, may lose power in elections next year.

In other talks in Beijing, senior officials from China and the European Union discussed ways of boosting their **security ties**. The EU's foreign-policy chief, Federica Mogherini, said co-operation between the two sides in combating piracy in the Gulf of Aden had been "extremely successful". She also praised China for its "precious" role in nuclear talks with Iran.

China accused the **Philippines** of "malicious hyping" in a dispute over territorial claims in the **South China Sea**. In a tit-for-tat row over satellite photographs showing land-reclamation work by China on several contested reefs, the Chinese foreign ministry claimed that the Philippines itself had engaged in "large-scale construction of military and civil facilities" on islands in the sea for many years.

Police in **Thailand** recovered 26 bodies from a mass grave in the south of the country near Malaysia. The dead are believed to be Rohingyas from Myanmar. It is likely that many of them died of disease or starvation while being trafficked through Thailand.

The death toll in an earthquake that struck **Nepal** on April 25th rose to more than 7,500. Thousands of foreign aid-workers have joined relief efforts. Some 3m people are in need of food supplies.

### Not as strong

Binyamin Netanyahu just about met the deadline to form a new government in **Israel**, after his victory in March's election. The foreign minister, Avigdor Lieberman, resigned and his group of six in the Knesset declined to join Mr Netanyahu's new coalition, which as a consequence will have a bloc of only 61 in the 120-seat parliament.

**Iranian** security forces arrested a prominent human-rights activist, Narges Mohammadi, soon after she was charged in court with crimes against national security.

A record 38m people have been **displaced** inside their own countries, nearly a third of them last year alone, according to a report by the Norwegian Refugee Council. Syria was the hardest hit overall, with 7.6m people, a third of the population, fleeing to other parts of the country. Iraq, South Sudan, the Democratic Republic of Congo and Nigeria had the highest number of people displaced last year.

Two African countries pledged to send soldiers to help Saudi Arabia in its military efforts against the Iranian-backed Houthi rebels in **Yemen. Senegal** is sending 2,100 men to help Saudi Arabia secure its border, while **Sudan**, once an ally of Iran, is reportedly deploying military advisers to Aden, a port city in southern Yemen that is still under tenuous government control.

### Is IS involved?

Two gunmen who opened fire outside an exhibition of cartoons of Muhammad in a suburb of **Dallas** were shot dead by police. The event had been attended by Geert Wilders, a Dutch politician and critic of Islam. One of the attackers had been under surveillance since 2006 for suspected jihadist activities; a possible link to Islamic State, which claimed responsibility, is being investigated.

Six police officers in **Baltimore** were charged over the death of Freddie Gray, who died from spinal-cord injuries he allegedly sustained in a police van. The charges range from misconduct to murder. A night curfew in the city that had been imposed following the rioting that broke out after Mr Gray's funeral was lifted.

Barack Obama nominated General Joe Dunford as chairman of the **joint chiefs of staff**, replacing General Martin Dempsey. General Dunford is a marine who led troops at the start of the Iraq invasion in 2003 and later in Afghanistan.

### Reaching across the seas

The United States approved the resumption of ferry services with **Cuba**, which were stopped by the embargo that it imposed on the island in 1960. The decision follows an agreement between the two countries in December to work toward normalising relations.

A **Mexican** drug gang shot down an army helicopter with a rocket-propelled grenade in the western state of Jalisco. It also set alight 11 banks and five petrol stations in violence provoked by a federal crackdown on the group. Fifteen people died, including six soldiers and a government official.

Hearings began at the International Court of Justice in The Hague on Bolivia's demand for **"sovereign access to the sea"**. The country lost its coastline to Chile in a war that began in 1879 and signed a treaty accepting the new borders. But Bolivia claims that Chile has a legal obligation to negotiate on its demand.

With a new poll showing her approval-rating stuck at a record low of 31%, Michelle Bachelet, **Chile's** president, asked her cabinet to resign. Ms Bachelet has been harmed by allegations concerning her son's business dealings. Opposition politicians, meanwhile, are dogged by a campaign-finance scandal.

### Generational shifts

**France's** National Front, led by Marine Le Pen, officially suspended the membership of her father Jean-Marie, who founded the party in 1972, for making racist and anti-Semitic comments.

The French National Assembly overwhelmingly passed a bill to give the authorities extensive new **surveillance powers**, including tapping mobile phones and e-mails and monitoring internet sites, with only limited judicial oversight. The bill was a response to recent terrorist attacks. Only a few civil-liberties groups expressed concern.

A storm blew up over claims that the **German intelligence services** were helping America to spy on European companies and individuals. Critics noted that less than two years ago Chancellor Angela Merkel, whose mobile phone had been tapped by American intelligence, protested that spying among friends was "simply not done."

**German travellers** endured a week of strikes, the longest in post-war history. The rail unions, which have staged eight stoppages in ten months.

## Business

The European Union outlined its strategy to create a **digital single market**. The thrust of the proposals include establishing standard rules for buying goods online, pruning cross-border regulations on telecoms and reducing the tax burden on businesses. But the plan also calls for a "comprehensive assessment" of whether Google, Facebook and other internet platforms distort competition. Still, the strategy was broadly welcomed. The EU expects it will generate €415 billion ($468 billion) a year for the economy and produce 3.8m new jobs.

American authorities levied their first civil penalty against a **virtual-currency exchange**. Ripple Labs, a startup backed by investors in Silicon Valley which operates a digital payment known as XRP that is similar to Bitcoin, was fined $700,000 for not complying with anti-money-laundering rules. It does not face criminal charges as it has promised to rejig its systems.

### Royal overthrow

PIMCO's Total Return Fund lost the crown it has worn for two decades as the **world's largest bond fund**. It was usurped by Vanguard's Total Bond Market Index Fund, which had $117 billion in assets in April, compared with $110 billion in Total Return. Investors have withdrawn roughly $110 billion from PIMCO since Bill Gross, its founder, widely known as the Bond King, was ousted in September.

Europe's blue-chip banks posted decent results. Profit at **UBS** almost doubled in the first quarter compared with the same period last year, to SFr2 billion ($2.1 billion), as business picked up at its stream-lined investment bank. This was despite the soaring value of the Swiss franc. Net profit at **Société Générale**, a French bank, soared to €868m ($977m), as its investment bank also benefited from increased global trading.

The chief executive of **HSBC**, Stuart Gulliver, suggested that the bank would make a decision about whether to move its headquarters away from London by the end of the year. It is the second time recently that senior management at HSBC, which makes most of its profit in Asia, has raised the idea of relocating because of tougher regulations in the City. Any move abroad would involve hundreds rather than thousands of its staff.

### Imports, exports and ports

A surge in imports after the end of an industrial dispute at ports on the West Coast helped to push America's **trade deficit** in March to $51.4 billion, the biggest monthly gap since October 2008. A recent initial estimate of GDP showed the economy growing by 0.2% in the first quarter; a second estimate that accounts for the wider trade gap will probably register a contraction.

The European Commission said that "positive economic tailwinds" such as cheaper oil and the European Central Bank's quantitative-easing programme mean that GDP should increase in the **euro zone** by 1.5% this year, slightly higher than had been previously forecast. Following four months of deflation, consumer prices in the currency bloc are estimated to have been flat in April, and are expected to pick up later in the year.

Although the **oil price** remains far below its 2014 peak, Brent crude touched $70 a barrel, the most since December. Oil is now 50% higher than in mid-January. The rebound helps to explain why yields on government **bonds** in America, Britain and Germany have sharply reversed the downward trend of recent weeks and risen to new highs for the year.

The Chinese government took more action to shake-up China's state-controlled giants. Trading in the shares of two of China's biggest **carmakers**, Dongfeng (which holds a 14% stake in Peugeot) and FAW, were suspended temporarily amid rumours that Beijing wants them to merge. And the senior management ranks were reshuffled at China's biggest **oil producers**, Sinopec, CNOOC and China National Petroleum Corporation.

**Tesla Motors**' net loss tripled in the first quarter compared with the same three months of last year, to $154m, despite a big increase in revenue and record deliveries of its Model S vehicle. Meanwhile, the maker of luxury electric cars unveiled a new range of battery packs, branded the "Powerwall", that store energy from solar panels for use in homes.

### Super cruise control

Daimler showed off its new **autonomous lorry**, which has been issued the first licence in the world to drive on public roads, by Nevada. The German company reckons self-driving commercial vehicles will come to market before driverless cars, as they spend most of their time on main roads with few obstructions. America's truckers need not fret about losing their jobs just yet; Daimler's 18-wheeler still needs a driver to perform tricky motoring off the highway, and to take the wheel when it crosses Nevada's state line.

Other economic data and news can be found on pages 84-85


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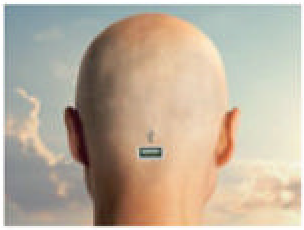
# The dawn of artificial intelligence

**Powerful computers will reshape humanity's future. How to ensure the promise outweighs the perils**



"THE development of full artificial intelligence could spell the end of the human race," Stephen Hawking warns. Elon Musk fears that the development of artificial intelligence, or AI, may be the biggest existential threat humanity faces. Bill Gates urges people to beware of it.

Dread that the abominations people create will become their masters, or their executioners, is hardly new. But voiced by a renowned cosmologist, a Silicon Valley entrepreneur and the founder of Microsoft—hardly Luddites—and set against the vast investment in AI by big firms like Google and Microsoft, such fears have taken on new weight. With supercomputers in every pocket and robots looking down on every battlefield, just dismissing them as science fiction seems like self-deception. The question is how to worry wisely.

### You taught me language and...

The first step is to understand what computers can now do and what they are likely to be able to do in the future. Thanks to the rise in processing power and the growing abundance of digitally available data, AI is enjoying a boom in its capabilities (see pages 18-21). Today's "deep learning" systems, by mimicking the layers of neurons in a human brain and crunching vast amounts of data, can teach themselves to perform some tasks, from pattern recognition to translation, almost as well as humans can. As a result, things that once called for a mind—from interpreting pictures to playing the video game "Frogger"—are now within the scope of computer programs. DeepFace, an algorithm unveiled by Facebook in 2014, can recognise individual human faces in images 97% of the time.

Crucially, this capacity is narrow and specific. Today's AI produces the semblance of intelligence through brute number-crunching force, without any great interest in approximating how minds equip humans with autonomy, interests and desires. Computers do not yet have anything approaching the wide, fluid ability to infer, judge and decide that is associated with intelligence in the conventional human sense.

Yet AI is already powerful enough to make a dramatic difference to human life. It can already enhance human endeavour by complementing what people can do. Think of chess, which computers now play better than any person. The best players in the world are not machines however, but what Garry Kasparov, a grandmaster, calls "centaurs": amalgamated teams of humans and algorithms. Such collectives will become the norm in all sorts of pursuits: supported by AI, doctors will have a vastly augmented ability to spot cancers in medical images; speech-recognition algorithms running on smartphones will bring the internet to many millions of illiterate people in developing countries; digital assistants will suggest promising hypotheses for academic research; image-classification algorithms will allow wearable computers to layer useful information onto people's views of the real world.

Even in the short run, not all the consequences will be positive. Consider, for instance, the power that AI brings to the apparatus of state security, in both autocracies and democracies. The capacity to monitor billions of conversations and to pick out every citizen from the crowd by his voice or her face poses grave threats to liberty.

And even when there are broad gains for society, many individuals will lose out from AI. The original "computers" were drudges, often women, who performed endless calculations for their higher-ups. Just as transistors took their place, so AI will probably turf out whole regiments of white-collar workers. Education and training will help and the wealth produced with the aid of AI will be spent on new pursuits that generate new jobs. But workers are doomed to dislocations.

Surveillance and dislocations are not, though, what worries Messrs Hawking, Musk and Gates, or what inspires a phalanx of futuristic AI films that Hollywood has recently unleashed onto cinema screens. Their concern is altogether more distant and more apocalyptic: the threat of autonomous machines with superhuman cognitive capacity and interests that conflict with those of *Homo sapiens*.

Such artificially intelligent beings are still a very long way off; indeed, it may never be possible to create them. Despite a century of poking and prodding at the brain, psychologists, neurologists, sociologists and philosophers are still a long way from an understanding of how a mind might be made—or what one is. And the business case for even limited intelligence of the general sort—the sort that has interests and autonomy—is far from clear. A car that drives itself better than its owner sounds like a boon; a car with its own ideas about where to go, less so.

### ...I know how to curse

But even if the prospect of what Mr Hawking calls "full" AI is still distant, it is prudent for societies to plan for how to cope. That is easier than it seems, not least because humans have been creating autonomous entities with superhuman capacities and unaligned interests for some time. Government bureaucracies, markets and armies: all can do things which unaided, unorganised humans cannot. All need autonomy to function, all can take on life of their own and all can do great harm if not set up in a just manner and governed by laws and regulations.

These parallels should comfort the fearful; they also suggest concrete ways for societies to develop AI safely. Just as armies need civilian oversight, markets are regulated and bureaucracies must be transparent and accountable, so AI systems must be open to scrutiny. Because systems designers cannot foresee every set of circumstances, there must also be an off-switch. These constraints can be put in place without compromising progress. From the nuclear bomb to traffic rules, mankind has used technical ingenuity and legal strictures to constrain other powerful innovations.

The spectre of eventually creating an autonomous non-human intelligence is so extraordinary that it risks overshadowing the debate. Yes, there are perils. But they should not obscure the huge benefits from the dawn of AI. ■

Making Indonesia grow

# Jokowi's to-do list

**Indonesia's president should ditch his economic nationalism—and, if necessary, his party**

HE SAYS it himself: expectations have been high since he became president in October, after a gripping election showed how Indonesia's democratic politics are impressively robust. Joko Widodo, or Jokowi as he is known, promises growth of 7% a year by 2018. Yet for all his fine aspirations, the country underwhelms. The economy is stumbling, growing by 4.7% in the first quarter compared with a year ago, the slowest pace since 2009. But most worrying is Jokowi's rhetoric of economic nationalism. Rather than an agent of change, he is sounding more like his tub-thumping predecessors. For the sake of 250m Indonesians, he needs to change his tune, and fast.

**Promises, promises**

A typical Indonesian earns half as much as his Chinese counterpart and a 20th as much as a citizen of nearby Singapore. The farthest-flung parts of the vast archipelago-state suffer from a tyranny of distance, shut off not only from world markets but also from the thriving Javanese economy around the capital, Jakarta. The country has relied too much on mining for coal and gold, and on stripping forests to make way for palm-oil plantations. Cronyism and corruption have flourished.

Jokowi says he will put an end to this. He promises the better life that has proved elusive for many Indonesians, at the same time as he pledges to stand up for his country.

His clarion call for growth is doing much to change what some call Indonesia's "acceptance of mediocrity". Government departments are becoming more open. Jokowi acknowledges the importance of improving Indonesians' poor schooling and the country's inadequate infrastructure, especially its roads, power and ports. And when it comes to individual projects, he is open to foreign capital (he has recently been courting the Chinese).

Yet his second promise, heavy with economic nationalism, runs counter to the first. Jokowi has recently called for a new economic order free of "the domination of certain groups and countries", for which read multinationals and global capitalism (see page 65). His "project-based" acceptance of foreign capital sends a grudging message to investors: we want your money, but spend it where we tell you to. Indonesia's negative-investment list, a tally of sectors in which foreigners may not put their money, only seems to grow.

Jokowi wants a national car project. His administration has tightened the enforcement of laws demanding that components of smartphones have to be produced domestically. He has handed money for infrastructure to inefficient state enterprises. And though he once hinted at lifting the job-destroying ban on exporting unprocessed mineral ore imposed by his predecessor, Susilo Bambang Yudhoyono, it remains in place and Jokowi has fallen silent about it.

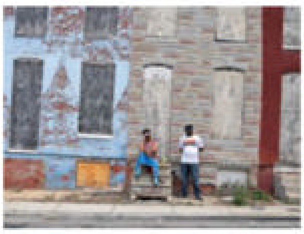
This meddling, nationalist attitude will scare off foreign investors and is the wrong way to boost Indonesia's prospects. A more open economy is essential to Jokowi's economic hopes, but his populism—the flip side of his man-of-the-people charm—seems to stop him from pointing that out. His silence also suggests that he is weak within his party, the PDI-P (which is led by Megawati Sukarnoputri, daughter of modern Indonesia's founding father and herself a former president).

Jokowi must change. In private he recognises the need for market-friendly measures. But resistance to these comes not just from within a business establishment built on cronyism but also from within the PDI-P itself. If necessary, he should break from the PDI-P to found his own party, using his popularity to champion the open policies that Indonesians need if they are to enjoy the life they crave. ■

How to prevent riots

# Fixing America's inner cities

**The problems of places like West Baltimore require a focus on safety and schools, not race**



AS BALTIMOREANS sweep up broken glass and haggle with insurers over fire-gutted shops, many are wondering why the city exploded into riots last month, and how to stop it happening again. The proximate cause of the mayhem is clear: it erupted after Freddie Gray, an African-American man, died in police custody. Young black men in Baltimore, as in many other American cities, are fed up with being manhandled by cops. Most demonstrated peacefully, but some seized the opportunity to steal, smash and burn.

Such destruction solves nothing—cities like Detroit and Newark have never truly recovered from the riots of the 1960s. But people in the poorest parts of Baltimore have good cause to be upset. In Sandtown-Winchester, the centre of the riots, less than half of adults have jobs and the murder rate, at 129 per 100,000, is worse than that of Honduras, the most homicidal nation on Earth. If Sandtown were a country, the State Department would advise you not to go there.

What is striking about Baltimore's slums is that they are islands of dystopia in a sea of middle-class comfort. A few minutes' drive from a world-class university and posh waterfront oyster bars is a place where houses are practically worthless and shopkeepers cower behind bulletproof glass. Sandtown's ▸▸

population is 97% black, but its troubles cannot glibly be blamed on white oppression. Baltimore has a black mayor, a black police chief and a black state's attorney, who swiftly indicted six police officers for the death of Mr Gray on charges including second-degree murder.

Black America's problems, like America's, are unevenly spread. Many African-Americans live white-picket-fence lives, but some cluster in districts of utter dysfunction, especially in cities where old industries have vanished. According to the Economic Policy Institute, a left-leaning think-tank, 45% of poor African-American children live in areas where 30% or more of their neighbours are poor. Only 12% of poor white children live amid such concentrated poverty.

### The wrong neighbourhood

The causes of all this are complex (see page 23). Some are historical: residential segregation by race was once the law in parts of America. Some are to do with family breakdown. Fifty years ago Daniel Patrick Moynihan, then an official in the Department of Labour, warned that the collapse of the black family was making black neighbourhoods poorer and more violent. At the time, 25% of black babies were born to single mothers; now the figure is an astounding 71%. Boys who grow up without fathers do worse in school, earn less as adults and are more likely to fall foul of the law. And single-parent families find it harder to save money, which is one reason why the assets of black households are worth less than those of white ones even when they earn as much (which most do not).

Growing up in a slum constricts your life chances. It is hard to learn in a school where doing your homework gets you ostracised, or to aspire to a good job when no one you know has one. For individuals the best answer may be to move. That is what much of the black middle class has done. And an experiment that allowed randomly selected families in very poor areas to move to nicer ones by giving them housing vouchers found that their children grew up to earn 31% more than peers who were left behind. However, the government cannot simply pay everyone who lives in a rough part of town to move out. It would cost a fortune and be politically impossible. Rather, policymakers should try harder to expand opportunities for those who remain.

The two priorities should be safer streets—no one wants to open a business in a free-fire zone—and better-nurtured minds. Cutting crime means shrewder, less heavy-handed policing, so that locals co-operate with cops. It means swift and certain punishments for criminals, but not necessarily harsh ones. An offender who stays out of prison wearing a GPS-enabled ankle bracelet is easier to track, reform and reintegrate into society. Legalising drugs would help too, since drug dollars empower gangsters and give them something to fight over.

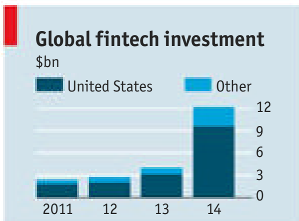
The task of nurturing minds begins in the womb, with better prenatal health care. It then requires better nurseries and more school choice, so that parents can move their children out of chaotic classrooms and into more motivated ones.

The sheer ambition of this agenda is a measure of how deep-set the slums' problems have become. But if policymakers want to stop America's inner cities exploding, they must pay more attention to the tensions building up inside them. ■

Financial services

# The fintech revolution

**A wave of startups is changing finance—for the better**




IN THE years since the crash of 2007-08, policymakers have concentrated on making finance safer. Regulators have stuffed the banks with capital and turned compliance from a back-office job into a corner-office one. Away from the regulatory spotlight, another revolution is under way—one that promises not just to make finance more secure for taxpayers, but also better for another neglected constituency: its customers.

The magical combination of geeks in T-shirts and venture capital that has disrupted other industries has put financial services in its sights. From payments to wealth management, from peer-to-peer lending to crowdfunding, a new generation of startups is taking aim at the heart of the industry—and a pot of revenues that Goldman Sachs estimates is worth $4.7 trillion. Like other disrupters from Silicon Valley, "fintech" firms are growing fast. They attracted $12 billion of investment in 2014, up from $4 billion the year before. Many of these businesses are long past the experimental phase, as our special report this week explains. Lending Club and OnDeck, two new lenders, have gone public; users of Venmo, a payments app, transferred $1.3 billion last quarter. In his latest annual letter to shareholders Jamie Dimon, the boss of JPMorgan Chase, warned that "Silicon Valley is coming."

The fintech firms are not about to kill off traditional banks. The upstarts are still tiny: Lending Club has arranged $9 billion in loans through its marketplace, small change compared with $885 billion of total credit-card debt in America. They have yet to be properly tested in a downturn. No fintech product comes close to matching the convenience and security of a current account at a bank. And banks will gain from many of the innovations. Square, for instance, is a system that makes it easier for small businesses to take card payments; it will boost banks' transaction volumes. Nonetheless, the fintech revolution will reshape finance—and improve it—in three fundamental ways.

First, the fintech disrupters will cut costs and improve the quality of financial services. They are unburdened by regulators, legacy IT systems, branch networks—or the need to protect existing businesses. Lending Club's ongoing expenses as a share of its outstanding loan balance is about 2%; the equivalent for conventional lenders is 5-7%. That means it can offer better deals to the borrowers and lenders who congregate on its platform. Half of the loan applications Funding Circle gets from small businesses arrive outside normal business hours. TransferWise takes a machete to the hefty fees that banks levy to send money across borders.

Second, the insurgents have clever new ways of assessing risk. The likes of Kabbage and OnDeck hoover up information, ▸▸

on everything from social-media reviews to companies' usage of logistics firms, to assess how well small businesses are doing. Avant uses machine learning to underwrite consumers whose credit scores were damaged during the financial crisis. Kickstarter uses the wisdom of crowds to finance startups.

This kind of data-driven lending has clear advantages over decisions based on a single credit score or meetings between banker and client. Humans are more prejudiced than algorithms: Italian banks charge female owners of small businesses more than male owners, even though the women have lower failure rates. The cost of relationship lending encourages bankers to chase big customers rather than small ones. For young businesses and borrowers on the fringes of the banking system, risk assessment that scours the online world for information is better than a loan officer in a branch.

Third, the fintech newcomers will create a more diverse, and hence stable, credit landscape. The business of internet-based firms is less geographically concentrated than that of bricks-and-mortar lenders: small American banks already use lending platforms to diversify their own portfolios. More important, the fintech firms avoid the two basic risks inherent in banking: mismatched maturities and leverage. Banks take in short-term liabilities such as deposits and turn them into long-term assets such as mortgages. Fintech lenders like Lending Club, Prosper and Zopa simply match borrowers and savers directly. Banks borrow heavily to fund lending; the new platforms do not. Instead, a lender commits its money until the final payment is due and it bears the risk of default.

### The lithe and the lumbering

If fintech platforms were ever to become the main sources of capital for households and firms, the established industry would be transformed into something akin to "narrow banking". Traditional banks would take deposits and hold only safe, liquid assets, while fintech platforms matched borrowers and savers. Economies would operate with much less leverage than today. But long before then, upstarts will force banks to accept lower margins. Conventional lenders will charge more for the services that the newcomers cannot easily replicate, including the payments infrastructure and the provision of an insured current account. The bigger effect from the fintech revolution will be to force flabby incumbents to cut costs and improve the quality of their service. That will change finance as profoundly as any regulator has. ■

Bribery

# Daft on graft

**A hard line on commercial bribery is right. But the system is becoming ridiculous**

IN 2008 Siemens, a German conglomerate, was fingered for handing out bribes in emerging markets. It has since spent a staggering $3 billion on fines and internal investigations to atone for its sins. Half of that has gone to advisers of one sort or another. Walmart, an American retailer, will soon have spent $800m on fees and compliance stemming from a bribery investigation in Mexico. The most complex bribery probes used to take three years. Now they last an average of seven.

In recent years lots of big economies, from Britain to Brazil, have followed America's lead in tightening anti-bribery enforcement (see page 62). Offences that once drew a slap on the wrist now attract fines in the hundreds of millions of dollars as well as prison terms for palm-greasing managers. It is right that bribery should be punished. The economic effects of graft are insidious. Bribery distorts competition and diverts national resources into crooked officials' offshore accounts. But the cost and complexity of investigations are spiralling beyond what is reasonable, fed by a ravenous "compliance industry" of lawyers and forensic accountants who have never seen a local bribery issue that did not call for an exhaustive global review; and by competing prosecutors, who increasingly run overlapping probes in different countries.

To stop a descent into investigative madness, enforcement needs to be reformed in four ways. First, regulators should rein in the excesses of the compliance industry and take into account the cost to firms of sprawling investigations. When firms admit to having uncovered bribery among their managers, regulators expect them to investigate themselves. The authorities should tell them what level of investigation they want so that companies are not overzealous out of fear of seeming evasive. This is slowly starting to happen, with officials telling firms they should not "aimlessly boil the ocean".

Second, governments should lower costs by harmonising anti-bribery laws and improving co-ordination between national probes. The OECD, whose anti-bribery convention has gained wide acceptance, is the natural body to lead this effort.

### More justice, please

Third, more cases should go to court. Too often, prosecutors strong-arm firms into agreeing to settlements based on controversial legal theories (one being peddled by American law enforcers is that hiring relatives of well-connected officials counts as bribery). Taking such matters to court would have the advantage of establishing clear precedents. When firms are loth to go to trial, because they are worried about the financial costs of a criminal charge, the terms of settlements should at least undergo more judicial scrutiny.

Lastly, anti-bribery laws should be amended to offer companies a "compliance defence". If firms can show that they had sound anti-bribery policies, that they were making reasonable efforts to uphold them, that the wrongdoing did not involve senior managers and that they came forward to the authorities promptly, the penalties should be greatly reduced.

As corrosive as bribery is, the response must be proportionate. Investigations that drag on are a waste of management and public resources. The starting-point for up to half of all cases is a firm's voluntary disclosure, but if costs continue to rise then firms may be more tempted to bury their bad news. Anti-corruption campaigners would have nothing to cheer if the cure ended up being more harmful than the disease. ■

## Follow the scrip

Free exchange (April 25th) outlined the possibility of the Greek government issuing "scrip", or temporary IOUs, to pay pensions and salaries in order to preserve euros for paying creditors. The column noted that scrip tends to be spent at once, a consequence of Gresham's law that "bad money chases out good". But Gresham's law only operates if the authorities attempt to maintain a fixed exchange rate between the two "currencies". If they are allowed to fluctuate against each other—in essence, if the scrip floats—Gresham's law is reversed and good money drives out bad.

This does not tell us which is the good money and which is the bad.

GABRIEL STEIN
Director
Asset Management Services
Oxford Economics
*London*

In his "1946: The Making of the Modern World", Victor Sebestyen quotes an American economic adviser's assessment of Greece that year:

> "…it was virtually bankrupt. The government had spent half the national income on non-productive uses…corruption is rampant and the civil service is a farce…the wealthy escape taxes and the [prime minister] is inept. There really is no state here in the Western concept, only a loose hierarchy of politicians who care only about their power struggles and lining their pockets."

Those comments still apply, except that Greece is now truly bankrupt.

ALASTAIR KANE
*Geelong, Australia*

## Israel's Supreme Court

The opening sentence of "Netanyahu v the Supreme Court" (May 2nd) got it exactly right: "Israel's Supreme Court has long been a solid pillar of the Jewish state's democracy". Regrettably, *The Economist* then proceeded to misrepresent the position of the prime minister, Binyamin Netanyahu, who has been a stalwart defender of the court.

Indeed, during his previous three terms in office, the prime minister proudly and consistently championed the independence of Israel's judiciary. He will do so vigorously during his fourth term as well, to ensure that the Israeli Supreme Court continues to be renowned worldwide for its professionalism and its integrity.

MARK REGEV
Spokesman of the Israeli prime minister
*Jerusalem*

## No boundaries to cricket


Your obituary on Richie Benaud (April 25th) found it surprising that there should be a French Cricket Association. Actually, France was the runner-up to Britain on the one occasion that the sport was included at the Olympics, in Paris in 1900. To be sure, neither the intensity of the tournament nor the criteria of eligibility and selection were particularly rigorous. The withdrawal of all the other intended entrants left Britain and France as the two finalists. The players were regarded subsequently as distinctly average club cricketers. A majority of the French side were British expatriates.

Even so, although the status of the match was unclear at the time (there was confusion between some of that year's Olympic events and the concurrent Universal Exposition), the International Olympic Committee decreed in 1912 that it was to be treated as an official Olympic contest, qualifying for the usual gold and silver medals.

STEPHEN POTTER
*Meudon, France*

## Manufacturing skills

We have considerable admiration for Sir James Dyson's effort to confront the problem of skill shortages in British engineering, and agree that technical understanding needs augmenting with a range of management and other practical skills for our graduates to start to make real contributions to engineering firms ("Mind the gap", April 11th). However, simply calling for a boost in numbers on engineering courses, with or without teaching in entrepreneurial skills, is unlikely to solve the problem.

In recent years there has been a big "leakage" in Britain—more than half for all engineering disciplines—of new engineering graduates away from the branches of manufacturing we might assume they would progress into. This suggests that employers are failing to make job offers that are as attractive as those from other industries, and must improve their game to get these graduates back.

MATTHEW DIXON
CRAIG HOLMES
Centre on Skills, Knowledge and Organisational Performance
University of Oxford

## Keeping it in the family

Your special report on family firms raised several important points (April 18th). However, looking at data from the Ownership Survey and the World Management Survey on small and medium firms it is not the case on average that family firms are leading the way in promoting women. Research by Renata Lemos and I has found a striking preference for first sons at the point of succession. Daughters are only considered when there are no sons, and even then other male family members (son-in-laws, nephews) are preferred.

DANIELA SCUR
Centre for Economic Performance
London School of Economics

For all the management mistakes that led to the failure of Banco Espírito Santo in Portugal, weak family governance played a part too. Ricardo Salgado, the chief executive, dominated the board, the executive committee and the family council and his power was unchecked. A strong and effective family council is needed to counter omnipotent executive power.

PETER VILLAX
President
Portuguese Family Business Association
*Lisbon*

Another and unusual yet classic case of a family firm is Villeroy & Boch. It is in its 267th year with an eighth-generation family member heading one of its divisions, yet reporting to a professional chief executive. Villeroy & Boch is traded on the German stockmarket and the family board has only a supporting role. A dozen family members are involved in various brand-building activities as individual professionals, be it hosting table-setting sessions with customers or educating dealers on new technology in the fast-growing luxury sanitary business.

AMIT GADKARI
*Dubai*

## Divine intervention

"A field guide to 2016" (April 25th) gave good pointers as to who may win the Republican nomination for the presidential election, but may have missed a trick with regard to the "dark horse" that is John Kasich. Since his declaration on "Meet the Press" that he is awaiting the guidance of the Lord on whether or not to run, the odds have changed a little.

Presumably the Lord's omnipotence will guarantee his eventual victory, and I for one will rush down to the bookmakers with all the talents at my disposal when his candidacy occurs.

NICK COX
*Singapore* ■

Letters are welcome and should be addressed to the Editor at
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**Closing date: 23:59 on 31 May 2015.**
**First round interviews are likely to be held on: 8 and 10 June 2015.**

## THE AFRICAN DEVELOPMENT BANK

### Appointment of a Member of the Roster of Experts of the Independent Review Mechanism of the African Development Bank Group

The Independent Review Mechanism (IRM) was established by the Boards of Directors of the African Development Bank Group in 2004 and became effective in 2006. The mandate of the IRM is to respond to complaints of people who are or likely to be adversely impacted by a Bank financed project due to non-compliance with the Bank Group policies and procedures. The mechanism handles the complaints through problem solving and/or compliance review. Also, for the purpose of enhancing institutional learning regarding problem-solving and compliance review matters, the IRM provides advisory services to the Bank. The IRM is administered by the Compliance Review and Mediation Unit (CRMU) headed by a Director, assisted by professional and support staff. Compliance review is undertaken by the IRM Roster of Experts, while problem – solving is carried out by CRMU.

The IRM's Roster of Experts comprises three (3) individual experts, each serving a fixed term of five years. The experts are appointed by the Boards of Directors upon the recommendation of the President. They work on part time basis, and sit in Independent Compliance Review Panels authorized by the Boards of Directors of the Bank Group or the President, depending on the status of the project. The Panels report their findings and recommendations to the Boards of Directors for projects approved by the Boards, and to the President for projects under consideration for financing by the Bank Group. The IRM experts also undertake annual spot checks to ensure projects' compliance with Bank's policies and procedures. Interested applicants can find more information about the IRM Operational Rules and Procedures on **http://www.afdb.org/en/about-us/structure/independent-review-mechanism-irm/about-the-irm/**

Applications for the position of a member of the Roster of Experts of the IRM are invited from individual experts/consultants who should be a national of a member state of the African Development Bank Group and fluent in English and French.

The applicant to be selected should demonstrate integrity and ability to act independently; have relevant, solid and broad academic background (minimum Master Degree, preferably PhD) with practical experience in development, particularly in environment, social, involuntary resettlement, economics, and legal issues in the public and/or private sector fields. They must have experience in compliance review and be in a position to act with impartiality in the accomplishment of their duties.

Further information on the function of IRM Expert, responsibilities as well as the requirements of the post, can be obtained from the Bank Website at: **www.afdb.org**

Applicants should register their personal history form and full CV on the Bank website: **www.afdb.org/jobs** by no later than **30 May 2015**.

**www.afdb.org**

# Rise of the machines

**Artificial intelligence scares people—excessively so**

ELON MUSK busies himself building other people's futures. A serial entrepreneur who made his first fortune in the early days of the world wide web, he has since helped found a solar-power company to generate green electricity, an electric-car firm to liberate motorists from the internal-combustion engine, and a rocketry business—SpaceX—to pursue his desire to see a human colony on Mars within his lifetime. It makes him the sort of technologist you would expect might look on tomorrow with unbridled optimism.

Not all future technology meets with his approval, though. In a speech in October at the Massachusetts Institute of Technology, Mr Musk described artificial intelligence (AI) as "summoning the demon", and the creation of a rival to human intelligence as probably the biggest threat facing the world. He is not alone. Nick Bostrom, a philosopher at the University of Oxford who helped develop the notion of "existential risks"—those that threaten humanity in general—counts advanced artificial intelligence as one such, alongside giant asteroid strikes and all-out nuclear war. Lord Rees, who used to run the Royal Society, Britain's foremost scientific body, has since founded the Centre for the Study of Existential Risk, in Cambridge, which takes the risks posed by AI just as seriously.

Such worries are a mirror image of the optimism suffusing the field itself, which has enjoyed rapid progress over the past couple of years. Firms such as Google, Facebook, Amazon and Baidu have got into an AI arms race, poaching researchers, setting up laboratories and buying startups. The insiders are not, by and large, fretting about being surpassed by their creations. Their business is not so much making new sorts of minds as it is removing some of the need for the old sort, by taking tasks that used to be things which only people could do and making them amenable to machines.

The torrent of data thrown off by the world's internet-connected computers, tablets and smartphones, and the huge amounts of computing power now available for processing that torrent, means that their algorithms are more and more capable of understanding languages, recognising images and the like. Business is taking notice. So are those who worry about technology taking away people's jobs. Lots of work depends on recognising patterns and translating symbols. If computers replace some of the people now doing this, either by providing an automated alternative or by making a few such workers far more productive, there will be more white collars in the dole queue.

Signs of the AI boom are everywhere. Last year, Google was rumoured to have paid $400m for DeepMind, a London-based AI startup. It snatched the firm from under the nose of Facebook, which boasts its own dedicated AI research laboratory, headed by Yann LeCun, a star researcher hired from New York University. Google once employed Andrew Ng, an AI guru from Stanford University—until Baidu poached him last year to head up a new, Silicon Valley-based lab of its own. Firms such as Narrative Science, in Chicago, which hopes to automate the writing of reports (and which is already used by *Forbes*, a business magazine, to cover basic financial stories), and Kensho, of Cambridge, Massachusetts, which aims to automate some of the work done by "quants" in the financial industry, have been showered in cash by investors. On April 13th IBM announced plans to use a version of its Watson computer—which crushed two puny human champions at an obscurantist American quiz show called Jeopardy! in 2011—to analyse health records, looking for medical insights.

## Deep thought

Research into artificial intelligence is as old as computers themselves. Much of the current excitement concerns a subfield of it called "deep learning", a modern refinement of "machine learning", in which computers teach themselves tasks by crunching large sets of data. Algorithms created in this manner are a way of bridging a gap that bedevils all AI research: by and large, tasks that are hard for humans are easy for computers, and vice versa. The simplest computer can run rings around the brightest person when it comes to wading through complicated mathematical equations. At the same time, the most powerful computers have, in the past, struggled with things that people find trivial, such as recognising faces, decoding speech and identifying objects in images.

One way of understanding this is that for humans to do things they find difficult, such as solving differential equations, they have to write a set of formal rules. Turning those rules into a program is then pretty simple. For stuff human beings find easy, though, there is no similar need for explicit rules—and trying to create them can be hard. To take one famous example, adults can distinguish pornography from non-pornography. But describing how they do so is almost impossible, as Potter Stewart, an American Supreme Court judge, discovered in 1964. Frustrated by the difficulty of coming up with a legally watertight definition, he threw up his hands and wrote that, although he could not define porn in the abstract, "I know it when I see it."

Machine learning is a way of getting computers to know things when they see them by producing for themselves the rules their programmers cannot specify. The machines do this with heavy-duty statistical analysis of lots and lots of data.

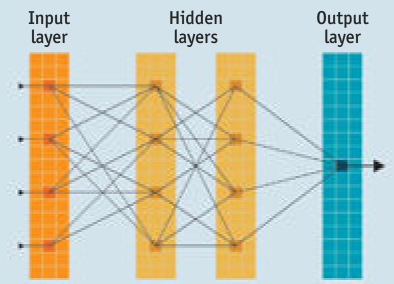
Many systems use an old and venerable piece of AI technology, the neural network, to develop the statistics that they need. Neural networks were invented in the 1950s by researchers who had the idea that, though they did not know what intelligence was, they did know that brains had it. And brains do their information processing not with transistors, but with neurons. If you could simulate those neurons—spindly, highly interlinked cells that pass electrochemical signals between themselves—then perhaps some sort of intelligent behaviour might emerge.

### Caught by the net

Neurons are immensely complex. Even today, the simulations used in AI are a stick-figure cartoon of the real thing. But early results suggested that even the crudest networks might be good for some tasks. Chris Bishop, an AI researcher with Microsoft, points out that telephone companies have, since the 1960s, been using echo-cancelling algorithms discovered by neural networks. But after such early successes the idea lost its allure. The computing power then available limited the size of the networks that could be simulated, and this limited the technology's scope.

**Layer cake**

How a neural network works to process an image




A neural network is organised into layers. Information from individual pixels causes neurons in the first layer to pass signals to the second, which then passes its analysis to the third. Each layer deals with increasingly abstract concepts, such as edges, shadows and shapes, until the output layer attempts to categorise the entire image.

In the past few years, however, the remarkable number-crunching power of chips developed for the demanding job of drawing video-game graphics has revived interest. Early neural networks were limited to dozens or hundreds of neurons, usually organised as a single layer. The latest, used by the likes of Google, can simulate billions. With that many ersatz neurons available, researchers can afford to take another cue from the brain and organise them in distinct, hierarchical layers (see diagram). It is this use of interlinked layers that puts the "deep" into deep learning.

Each layer of the network deals with a different level of abstraction. To process an image, for example, the lowest layer is fed the raw images. It notes things like the brightness and colours of individual pixels, and how those properties are distributed across the image. The next layer combines these observations into more abstract categories, identifying edges, shadows and the like. The layer after that will analyse those edges and shadows in turn, looking for combinations that signify features such as eyes, lips and ears. And these can then be combined into a representation of a face—and indeed not just any face, but even a new image of a particular face that the network has seen before.

To make such networks useful, they must first be trained. For the machine to program itself for facial recognition, for instance, it will be presented with a "training set" of thousands of images. Some will contain faces and some will not. Each will be labelled as such by a human. The images act as inputs to the system; the labels ("face" or "not face") as outputs. The computer's task is to come up with a statistical rule that correlates inputs with the correct outputs. To do that, it will hunt at every level of abstraction for whatever features are common to those images showing faces. Once these correlations are good enough, the machine will be able, reliably, to tell faces from not-faces in its training set. The next step is to let it loose on a fresh set of images, to see if the facial-recognition rules it has extracted hold up in the real world.

By working from the bottom up in this way, machine-learning algorithms learn to recognise features, concepts and categories that humans understand but struggle to define in code. But such algorithms were, for a long time, narrowly specialised. Programs often needed hints from their designers, in the form of hand-crafted bits of code that were specific to the task at hand—one set of tweaks for processing images, say, and another for voice recognition.

Earlier neural networks, moreover, had only a limited appetite for data. Beyond a certain point, feeding them more information did not boost their performance. Modern systems need far less hand-holding and tweaking. They can also make good use of as many data as you are able throw at them. And because of the internet, there are plenty of data to throw.

Big internet companies like Baidu, Google and Facebook sit on huge quantities of information generated by their users. Reams of e-mails; vast piles of search and buying histories; endless images of faces, cars, cats and almost everything else in the world pile up in their servers. The people who run those firms know that these data contain useful patterns, but the sheer quantity of information is daunting. It is not daunting for machines, though. The problem of information overload turns out to contain its own solution, especially since many of the data come helpfully pre-labelled by the people who created them. Fortified with the right algorithms, computers can use such annotated data to teach themselves to spot useful patterns, rules and categories within.

The results are impressive. In 2014 Facebook unveiled an algorithm called DeepFace that can recognise specific human

**Some you win, some you lose**

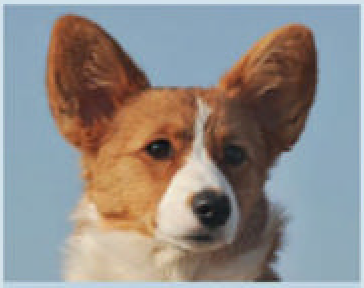
Image-recognition software's analysis of what a picture represents

"A person riding a motorcycle on a dirt road"

"A yellow school bus parked in a car park"

Source: "Show and Tell: A Neural Image Caption Generator", Oriol Vinyals, Alexander Toshev, Samy Bengio, Dumitru Erhan

### Spot...



This is a Cardigan Corgi, one of two types of Welsh Corgi. Slightly larger and heavier-boned than the Pembroke Corgi.

### ...the difference

This is a Pembroke Corgi, the more common of the two types of Welsh Corgi and the one favoured by the queen.

faces in images around 97% of the time, even when those faces are partly hidden or poorly lit. That is on a par with what people can do. Microsoft likes to boast that the object-recognition software it is developing for Cortana, a digital personal assistant, can tell its users the difference between a picture of a Pembroke Welsh Corgi and a Cardigan Welsh Corgi, two dog breeds that look almost identical (see pictures above). Some countries, including Britain, already use face-recognition technology for border control. And a system capable of recognising individuals from video footage has obvious appeal for policemen and spies. A report published on May 5th showed how America's spies use voice-recognition software to convert phone calls into text, in order to make their contents easier to search.

But, although the internet is a vast data trove, it is not a bottomless one. The sorts of human-labelled data that machine-learning algorithms thrive on are a finite resource. For this reason, a race is on to develop "unsupervised-learning" algorithms, which can learn without the need for human help.

There has already been lots of progress. In 2012 a team at Google led by Dr Ng showed an unsupervised-learning machine millions of YouTube video images. The machine learned to categorise common things it saw, including human faces and (to the amusement of the internet's denizens) the cats—sleeping, jumping or skateboarding—that are ubiquitous online. No human being had tagged the videos as containing "faces" or "cats". Instead, after seeing zillions of examples of each, the machine had simply decided that the statistical patterns they represented were common enough to make into a category of object.

The next step up from recognising individual objects is to recognise lots of different ones. A paper published by Andrej Karpathy and Li Fei-Fei at Stanford University describes a computer-vision system that is able to label specific parts of a given picture. Show it a breakfast table, for instance, and it will identify the fork, the banana slices, the cup of coffee, the flowers on the table and the table itself. It will even generate descriptions, in natural English, of the scene (see picture below)—though the technology is not yet perfect (see picture on previous page).

Big internet firms such as Google are interested in this kind of work because it can directly affect their bottom lines. Better image classifiers should improve the ability of search engines to find what their users are looking for. In the longer run, the technology could find other, more transformative uses. Being able to break down and interpret a scene would be useful for robotics researchers, for instance, helping their creations—from industrial helpmeets to self-driving cars to battlefield robots—to navigate the cluttered real world.

Image classification is also an enabling technology for "augmented reality", in which wearable computers, such as Google's Glass or Microsoft's HoloLens, overlay useful information on top of the real world. Enlitic, a firm based in San Francisco, hopes to employ image recognition to analyse X-rays and MRI scans, looking for problems that human doctors might miss.

And deep learning is not restricted to images. It is a general-purpose pattern-recognition technique, which means, in principle, that any activity which has access to large amounts of data—from running an insurance business to research into genetics—might find it useful. At a recent competition held at CERN, the world's biggest particle-physics laboratory, deep-learning algorithms did a better job of spotting the signatures of subatomic particles than the software written by physicists—even though the programmers who created these algorithms had no particular knowledge of physics. More whimsically, a group of researchers have written a program that learnt to play video games such as "Space Invaders" better than people can.

A computer's take on breakfast. Each box is part of a picture that it has identified and labelled, including "bouquet of red flowers", "glass of water with ice and lemon" and "banana slices". The whole was deemed to show a "dining table with breakfast items".

Machine translation, too, will be improved by deep learning. It already uses neural networks, benefiting from the large quantity of text available online in multiple languages. Dr Ng, now at Baidu, thinks good speech-recognition programs running on smartphones could bring the internet to many people in China who are illiterate, and thus struggle with ordinary computers. At the moment, 10% of the firm's searches are conducted by voice. He believes that could rise to 50% by 2020.

And those different sorts of AI can be linked together to form an even more capable system. In May 2014, for instance, at a conference in California, Microsoft demonstrated a computer program capable of real-time translation of spoken language. The firm had one of its researchers speak, in English, to a colleague in Germany. This colleague heard her interlocutor speaking in German. One AI program decoded sound waves into English phrases. Another translated those phrases from English into German, and a third rendered them into German speech. The firm hopes, one day, to build the technology into Skype, its internet-telephony service.

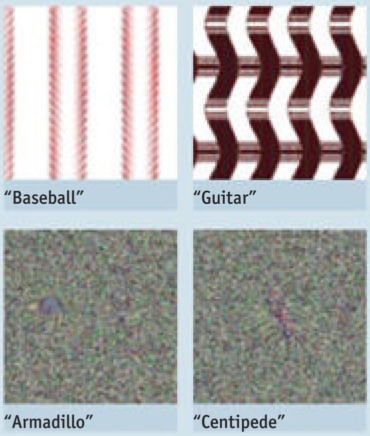
**No ghost in the machine**

Better smartphones, fancier robots and bringing the internet to the illiterate would all be good things. But do they justify the existential worries of Mr Musk and others? Might pattern-recognising, self-programming computers be an early, but crucial, step on the road to machines that are more intelligent than their creators?

The doom-mongers have one important fact on their side. There is no result from decades of neuroscientific research to suggest that the brain is anything other than a machine, made of ordinary atoms, employing ordinary forces and obeying the ordinary laws of nature. There is no mysterious "vital spark", in other words, that is necessary to make it go. This suggests that building an artificial brain—or even a machine that looks different from a

**Pattern recognition**

A few examples of the machine getting it spectacularly wrong




Source: "Show and Tell: A Neural Image Caption Generator", Oriol Vinyals, Alexander Toshev, Samy Bengio, Dumitru Erhan

brain but does the same sort of thing—is possible in principle.

But doing something in principle and doing it in fact are not remotely the same thing. Part of the problem, says Rodney Brooks, who was one of AI's pioneers and who now works at Rethink Robotics, a firm in Boston, is a confusion around the word "intelligence". Computers can now do some narrowly defined tasks which only human brains could manage in the past (the original "computers", after all, were humans, usually women, employed to do the sort of tricky arithmetic that the digital sort find trivially easy). An image classifier may be spookily accurate, but it has no goals, no motivations, and is no more conscious of its own existence than is a spreadsheet or a climate model. Nor, if you were trying to recreate a brain's workings, would you necessarily start by doing the things AI does at the moment in the way that it now does them. AI uses a lot of brute force to get intelligent-seeming responses from systems that, though bigger and more powerful now than before, are no more like minds than they ever were. It does not seek to build systems that resemble biological minds. As Edsger Dijkstra, another pioneer of AI, once remarked, asking whether a computer can think is a bit like asking "whether submarines can swim".

**A snare and an illusion**

Nothing makes this clearer than the ways in which AI programs can be spoofed. A paper to be presented at a computer-vision conference in June shows optical illusions designed to fool image-recognition algorithms (see picture above). These offer insight into how the algorithms operate—by matching patterns to other patterns, but doing so blindly, with no recourse to the sort of context (like realising a baseball is a physical object, not just an abstract pattern vaguely reminiscent of stitching) that stops people falling into the same traps. It is even possible to construct images that, to a human, look like meaningless television static, but which neural networks nevertheless confidently classify as real objects.

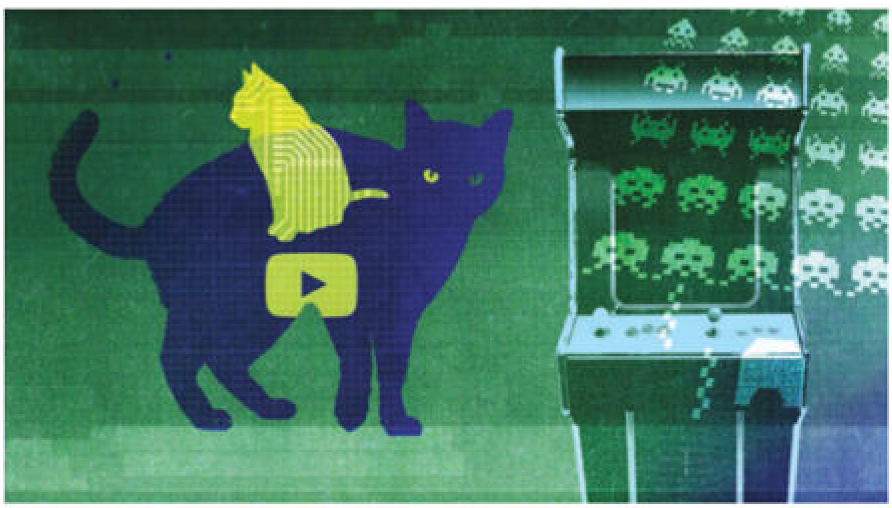
This is not to say that progress in AI will have no unpleasant consequences, at least for some people. And, unlike previous waves of technological change, quite a few of those people may be middle class. Take Microsoft's real-time translation. The technology it demonstrated was far from perfect. No one would mistake its computer-translated speech for the professionally translated sort. But it is adequate to convey the gist of what is being said. It is also cheaper and more convenient than hiring a human interpreter. Such an algorithm could therefore make a limited version of what is presently a costly, bespoke service available to anyone with a Skype account. That might be bad for interpreters. But it would be a boon for everyone else. And Microsoft's program will only get better.

The worry that AI could do to white-collar jobs what steam power did to blue-collar ones during the Industrial Revolution is therefore worth taking seriously. Examples, such as Narrative Science's digital financial journalist and Kensho's quant, abound. Kensho's system is designed to interpret natural-language search queries such as, "What happens to car firms' share prices if oil drops by $5 a barrel?" It will then scour financial reports, company filings, historical market data and the like, and return replies, also in natural language, in seconds. The firm plans to offer the software to big banks and sophisticated traders. Yseop, a French firm, uses its natural-language software to interpret queries, chug through data looking for answers, and then write them up in English, Spanish, French or German at 3,000 pages a second. Firms such as L'Oréal and VetOnline.com already use it for customer support on their websites.

Nor is this just a theoretical worry, for some white-collar jobs are already being lost to machines. Many firms use computers to answer telephones, for instance. For all their maddening limitations, and the need for human backup when they encounter a query they cannot understand, they are cheaper than human beings. Forecasting how many more jobs might go the same way is much harder—although a paper from the Oxford Martin School, published in 2013, scared plenty of people by concluding that up to half of the job categories tracked by American statisticians might be vulnerable.

Technology, though, gives as well as taking away. Automated, cheap translation is surely useful. Having an untiring, lightning-fast computer checking medical images would be as well. Perhaps the best way to think about AI is to see it as simply the latest in a long line of cognitive enhancements that humans have invented to augment the abilities of their brains. It is a high-tech relative of technologies like paper, which provides a portable, reliable memory, or the abacus, which aids mental arithmetic. Just as the printing press put scribes out of business, high-quality AI will cost jobs. But it will enhance the abilities of those whose jobs it does not replace, giving everyone access to mental skills possessed at present by only a few. These days, anyone with a smartphone has the equivalent of a city-full of old-style human "computers" in his pocket, all of them working for nothing more than the cost of charging the battery. In the future, they might have translators or diagnosticians at their beck and call as well.

Cleverer computers, then, could be a truly transformative technology, though not—at least, not yet—for the reasons given by Mr Musk or Lord Rees. One day, perhaps, something like the sort of broad intelligence that characterises the human brain may be recreated in a machine. But for now, the best advice is to ignore the threat of computers taking over the world—and check that they are not going to take over your job first. ■

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Black America

# The fire and the fuel

BALTIMORE

**What a dead white man can teach America about inner-city decay**

YOUNG black men out in the streets at night, lines of police officers dressed for a riot, cars ablaze, stores looted, the morning-after platitudes about coming together: the recent scenes in Baltimore (pictured) recall similar ones in Ferguson, Missouri in 2014, Cincinnati in 2001, Los Angeles in 1992 or half a dozen cities in 1968.

The Baltimore riots were sparked by the death of Freddie Gray, a black man, in police custody. But the underlying cause was more complex. Wali Uqdah, a retired prison officer in the city, says: "It's a building up of hostility. It's not about just one incident; it's like if I leave a pot on my stove, and I go outside, it's just going to get hot and hot until it boils over. There's no jobs, no income, no good schools…"

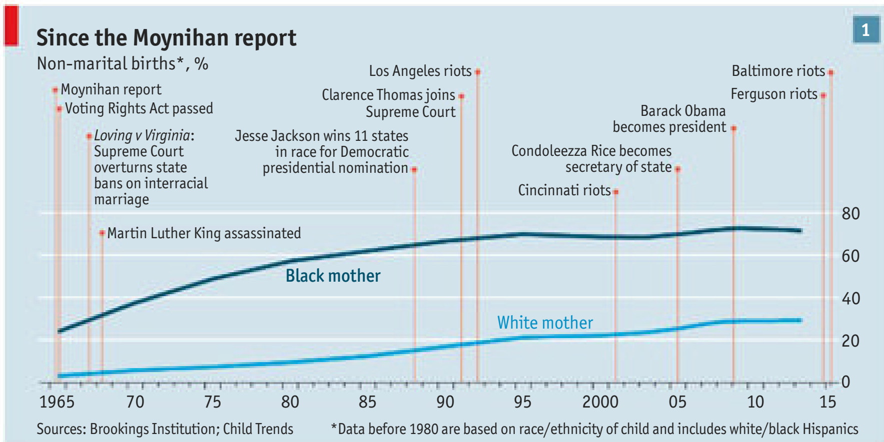
Many Americans feel a confused sense of guilt when the problems of poor black neighbourhoods come to their attention, unsure whether the persistence of crime and poverty in such places is, in some convoluted way, their fault or the fault of the people who live there, and unsure what can be done about it. On the one hand, they see that the police are sometimes racist. On the other, they note that tensions between blacks and cops persist even in cities like Baltimore that have a black mayor, a black police chief and a mostly non-white police force. Shortly after the riots, six officers were indicted for abusing Mr Gray, on charges including second-degree murder. Three of the cops were black.

This year marks the 50th anniversary of a bold and controversial attempt to explain what has gone wrong in America's inner cities: Daniel Patrick Moynihan's "The Negro Family: The Case for National Action". Moynihan, then a bureaucrat in the Department of Labour, made two main points. First, he argued that the lingering effects of two centuries of slavery had undermined the black family—at the time, 25% of black babies were born to unmarried mothers (see chart 1). Second, he argued that family instability was at the root of many other problems, from crime to poverty.

Fifty years later, black America still fares badly on many of the predictors of success and signals of distress that concerned Moynihan. If it were a separate country, it would have a worse life expectancy than Mexico, a worse homicide rate than Ivory Coast and a higher proportion of its citizens behind bars than anywhere on earth (see chart 2). This is despite the fact that, overall, America is home to the richest, most successful population of black African descent that the world has ever seen.

America is also far less racist than it was in Moynihan's day, when interracial marriage was still illegal in 19 states. Now it has a black president—who won more of the white vote in 2008 than John Kerry, a white Democrat, won in 2004. The census form today allows people to identify themselves as white and black, too. In 2010 over 2m did so, breaking through the thickest wall in American history with a few strokes of a pen.

Yet an updated Moynihan report would also have to acknowledge the prescience of that tall white Irishman. The proportion of African-American babies born outside marriage has nearly tripled since 1965, to 71%. Though the crime rate has fallen across the country in the past two decades, casting some doubt on Moynihan's link between single-parenting and disorder, black Americans are still eight times more likely to be murdered than whites and seven times more likely to com-

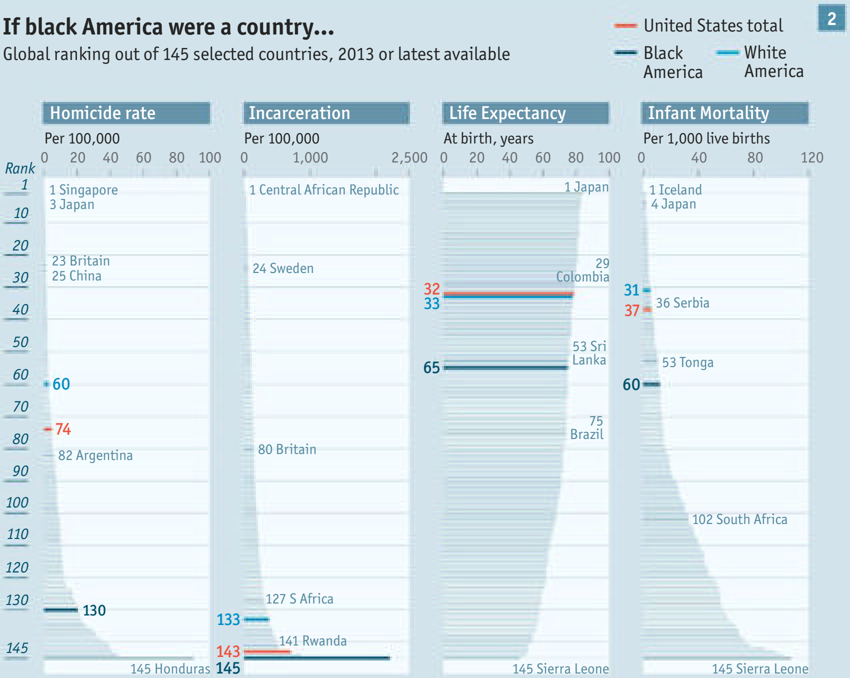



Sources: Brookings Institution; Child Trends

*Data before 1980 are based on race/ethnicity of child and includes white/black Hispanics

**If black America were a country...**

Global ranking out of 145 selected countries, 2013 or latest available




Sources: World Bank; UNODC; International Centre for Prison Studies; WHO; Prison Policy Intiative; Centres for Disease Control; FBI; *The Economist*

**Interactive:** Compare black and white America against more countries and international groups at **Economist.com/b&wamerica**

mit murder, according to the FBI. An incredible one-third of black men in their 30s have been in prison. Blacks are also less likely to graduate from college than whites, and less socially mobile (see chart 3).

Historians have gone back and forth on the link Moynihan made between slavery and the fragility of the black family, but many now agree with him. "The obvious explanation turns out to be the right one," says Orlando Patterson of Harvard, who points out that every black population in the Americas has low rates of two-parent families. "If you have many generations in which you are not permitted to have a relationship, in which you have no custodial rights to your children or spouse and your family members can be sold away, that has an effect," says Mr Patterson. Yet events in the 19th century cannot explain why black families have grown so much more fissile since the 1960s, nor why white families now have non-marital birth rates as high as the black ones that so alarmed Moynihan in 1965. Slavery may have started the dissolution of the black family, but something else must have accelerated it.

Because the nationwide decline in marriage began at around the same time as Lyndon Johnson's Great Society programmes, some argue that welfare is the culprit. Social conservatives complain that for many families, a welfare cheque has replaced the male breadwinner, making him superfluous. Worse, single mothers who tie the knot are often penalised, since the addition of a father's income to the household total causes all manner of means-tested benefits to be withdrawn. However, studies looking at how marriage varies between states with different rules on eligibility for Medicaid, one of the largest of the many means-tested programmes, have failed to find a link. "I would never say welfare plays no role," says Isabel Sawhill of the Brookings Institution, a think-tank, "but it's not the main thing."

Analysts on the left argue that the collapse of the black family is largely a consequence of slumping wages for unskilled black men, which makes them less attractive as mates. But this, too, can only be a partial explanation. As incomes rise, Americans of all stripes are more likely to get married. But even accounting for this, black families look different from white ones. Black women with advanced degrees are about as likely to be single mothers as white women with a high-school diploma. The gap between black and white families only disappears once the household incomes of black families rise above $200,000 a year—a tiny minority.

Another explanation for the low marriage rate among African-Americans is that many black men are "missing", either because they have died early or because they are in prison. For every 100 non-incarcerated African-American women aged 25-54, there are only 83 black men, according to the *New York Times*. For whites, the ratio is 100 to 99: ie, there is hardly any gap at all.

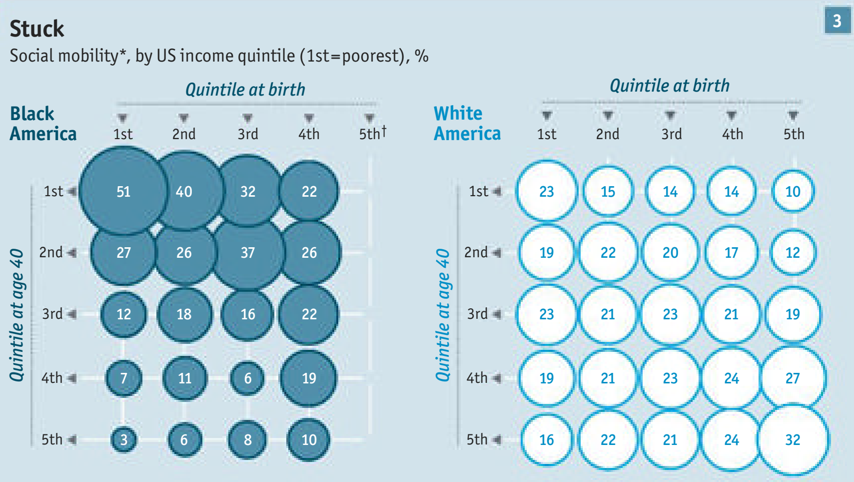
Kathy Edin of Johns Hopkins University interviewed hundreds of inner-city single mothers. Many told her that having a child was a way to give purpose to life and (they hoped) hold on to a boyfriend. For the men she spoke to, fatherhood was a source of pride. For the children of such unions, that may be scant comfort.

Growing up in a single-parent family makes life harder for most children. The Fragile Families study run from Princeton and Columbia universities, which examines how children born to single mothers fare, has found that 30% have had two or more father figures in their home by their fifth birthday. Some 40% of households headed by single mothers are poor; for two-parent families the proportion is 9%. Those numbers, which put black children in a precarious place, are made worse by the places where black families live. And there is nothing random about that.

Most of the black Americans who are now struggling are the left-behinds of two great internal migrations. The first, from south to north in the early 20th century, left behind people in the Mississippi Delta, which is now the poorest bit of the country. More recently a second migration has been going on, from northern cities to southern ones. For the past two decades Georgia has attracted more black migrants than any other state. This smaller exodus has left ▸▸

**Stuck**

Social mobility*, by US income quintile (1st=poorest), %




Source: Brookings Institution

*Children born mainly in the 1980s-90s †Insufficient data

SAP®

# The future of business: Human resources

## How HR leaders are reinventing their roles and transforming business

The human resources (HR) landscape is being transformed by the emerging digital economy, illustrated by the rise of LinkedIn and other social networking websites. And just as the business-to-consumer (B2C) arena has become more transparent and connected due to new web-based customer outreach methods like Amazon.com-style retailing, so too have LinkedIn and related capabilities changed the ways in which employers and prospective employees interact.

As these changes gather pace, the challenges and opportunities confronting chief human resources officers (CHROs) increasingly parallel those facing chief marketing officers (CMOs).

Digital connectivity enables interactions between customers and marketers to occur almost anywhere at almost any time. Hence CMOs have been employing a growing array of tools that use social, mobile, analytics and cloud technologies. These tools enable marketers to transform the marketing function into a more proactively pervasive model in which marketers can get closer to customers by engaging with them as the latter travel along their "customer journeys".

Similarly, CHROs are turning to a broadening suite of digital capabilities that can enable HR departments to engage with prospective, current and past employees as they move through the new landscape defined by the ever-expanding connections of the digital economy.

For example, some HR managers are aggregating data from internal sources, social media sites and special interest forums to produce rankings that identify suitable prospects for open positions. Using similar data and analytics, managers can also identify key employees who may leave their firms and develop more effective training and mentoring programmes to increase retention.

By leveraging newly available data and analytics tools, HR leaders will be better able to help their organisations create value across a broad spectrum, thereby enhancing their own role and stature in the process.

▶ *Read the full report written by The Economist Intelligence Unit, sponsored by SAP, to understand how the HR landscape is changing at* ***www.futureofhr.eiu.com***

A report written by

The Economist Intelligence Unit

people behind in highly segregated bits of northern cities—such as West Baltimore, which is 96% black. Despite living in some of the most benighted places in the country, African-Americans are the least likely to move of any ethnic group.

These left-behind neighbourhoods, which can be found in Milwaukee, Detroit, Philadelphia, Washington, DC, New York, Chicago and dozens of smaller cities, are the places where black migrants were funnelled in the mid-20th century under racist housing policies. Baltimore was the first city to formalise residential segregation by race, but others soon followed. In 1942, with black GIs preparing to go to war, 84% of white Americans told pollsters that "there should be separate sections in towns for Negroes." De jure racial segregation is now a thing of the past, and de facto segregation has declined since 1970. But it has not done so evenly: on a scale where 0 means blacks are evenly distributed and 100 means they live completely separately, Milwaukee scores 82, New York 78 and Chicago 76. Anything above 60 is high.

Dante Washington, a Baltimore native in his 30s, grew up in one of these places, in a house passed down by his grandmother to his mother in a neighbourhood where gunfire began when the sun set. He recalls being in his bedroom one night, hearing shots in the street outside and not bothering to look. The next morning he discovered that the brother of his best friend had been killed. Another friend was murdered on a basketball court for no clear reason. Mr Washington graduated from college and now works as a publisher in a suburb of the city that has a Lexus dealership and where the dogs yap rather than snarl.

Stories such as his are far too rare. Karl Alexander and his colleagues at Johns Hopkins studied 790 six-year olds who entered Baltimore public schools in 1982, following them for the next 22 years. Of the kids who started at the bottom, in low-income families where the parents had a combined total of ten years' schooling, only 4% graduated from college.

The house Mr Washington's grandmother left his mother now has seven boarded-up properties for neighbours. In West Baltimore whole blocks have gone: a tree that has grown inside one house is visible through the glassless upper-storey windows. Plenty of houses are worth nothing or, if they have tax bills owing, even less. The whole area consists of 62,000 people (within a prosperous metropolitan area of 2.7m). The murder rate is 97 per 100,000—20 times the American average (see chart 4).

The gap between what black and white families earn is large enough. The wealth gap is much larger: the median white family in 2013 had net assets of $142,000; the median black family had a paltry $11,000 (see chart 5). Wealth gaps are nearly always bigger than income gaps, since people who earn more find it easier to save. For black households, this is often exacerbated by absent fathers. A one-parent family with the same income as a two-parent family is probably spending a lot more of its spare cash on child care.

Saving is extremely hard under such circumstances, which is one reason why black families find it harder to buy a house than white families with the same income, and why black university students rack up larger debts. Some 60% of black students have yet to complete a four-year degree after six years, compared with 37% of whites. Some cannot afford the books or the train fare or need to look after a sibling or work to support their families. "You start off wanting to be a policeman or a doctor," says Mr Washington. "Eventually you just want to eat tomorrow."

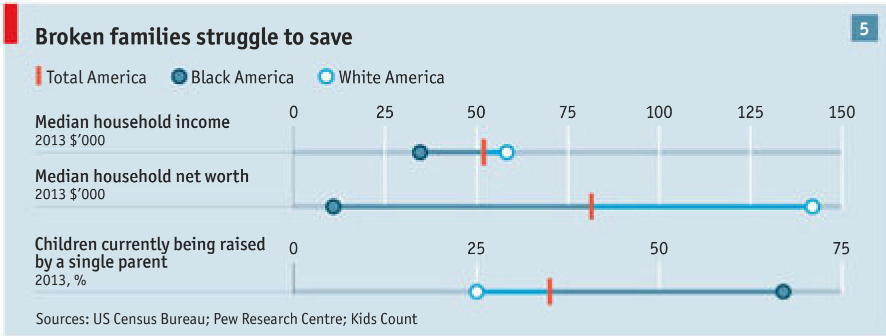
What if black Americans in the worst neighbourhoods were given a chance to move out? In 1966 the Chicago city government was taken to court for building all its public housing in areas that were wholly black. By way of compensation, it provided vouchers for 7,500 families to move to nicer (and whiter) parts of the city and its suburbs. Studies found that 15-20 years later the families were still in their new neighbourhoods and their children were attending better schools and doing better than those who stayed behind.

After the Los Angeles riots in 1992 the federal government tried to copy this scheme in other cities. Until recently, the results were considered disappointing. Those who moved out of public housing in crime-ridden places showed lower rates of diabetes than those who remained, and mothers who moved showed an increase in happiness similar to the effects of Prozac, an antidepressant. However, children did no better after moving and their mothers did not get better jobs.

In a paper published this month, however, Raj Chetty and colleagues at Harvard re-examined the numbers and found that the children who moved earned considerably more in their 20s. This was true only of children who moved before their 13th birthday: older children saw no benefit later on. More recently, Baltimore lost a public-housing case similar to the one in Chicago and, in 2005, provided vouchers for 7,000 families to move to other parts of Maryland. They are still there, and three-quarters of their children are attending much better schools, says Stefanie Deluca of Johns Hopkins. Yet since giving a golden ticket to every poor black family would cost about $30 billion a year, those stuck in highly segregated places will have to save in order to get out.

Government probably cannot do much to put broken families back together. But cities could change the way their police forces work, as Los Angeles and New York have done. Prosecutors and judges could explore alternatives to mass incarceration. School systems could give parents more choice, so their children can escape from dysfunctional schools. All these things and more could make marginal improvements that, when added together, would amount to something greater.

"That the Negro American has survived at all is extraordinary," wrote Moynihan. "A lesser people might simply have died out, as indeed others have." On the 50th anniversary of his report it is worth remembering that freedom, in the sense of being allowed to live where you choose, is still a recent acquisition for African-Americans. In another 50 years the lines that divide black and white America, which have begun to fade, will be fainter still. ■




Campaign 2016

# Enter Carly, Mike and Ben

WASHINGTON, DC

**Three Republicans with little chance of victory but who may influence the race**

CARLY FIORINA (pictured), a former chief executive of Hewlett-Packard and one of the latest Republican candidates for the presidency, has a simple pitch. She is a woman and she is not Hillary Clinton. To make this point as subtly as possible her campaign launch video, released on May 4th, begins with a scene of Ms Fiorina turning off a television showing Mrs Clinton's launch video. On the stump she repeatedly accuses the Democratic front-runner of being untrustworthy. She adds: "Mrs Clinton, name an accomplishment?"

Ms Fiorina is one of three new candidates who have jumped into the Republican mêlée this week. She was joined a day later by Mike Huckabee, a former governor of Arkansas who announced his intention to run from his hometown of Hope, where Bill Clinton was also born. He delivered a bombastic speech, lamenting "the slaughter of over 55m babies in the name of choice". The elderly audience chanted "We love Huck". The third contender is Ben Carson, a retired brain surgeon who was the first to separate twins joined at the head. Mr Carson has also dabbled as a Fox News pundit, and is the only black presidential candidate from either party. A week before, on the Democratic side, Hillary Clinton gained her first formal challenger: Bernie Sanders, a senator from Vermont.

None of these new candidates has much chance of winning. Mr Sanders is an experienced politician but, as the only self-described socialist in Congress, he is a tough sell outside the Green Mountain State. His real aim is probably to pull Mrs Clinton to the left economically.

Ms Fiorina was once a technology titan, but she has never won an election. In 2010 she ran for one of California's seats in the Senate. She lost by 42% to 52% against a veteran incumbent. Mr Carson has never fought an election. He has built a political career out of his life story (he was raised by a single mother in a rough part of Detroit), his soft-spoken faith and his habit of saying outrageous things—he once described America under Barack Obama as being "very much like Nazi Germany".

Only Mr Huckabee has ever been a serious contender. In 2008 he came second in the Republican primaries, charming evangelical voters with his wisecracks, guitar-playing and Biblical allusions. Since then he has written books (his latest is called "God, Guns, Grits and Gravy") and made a lot of money as a television pundit. He will not win, but he may force other candidates to fight harder for the votes of older, religious conservatives. His launch speech featured a defence of Social Security and Medicare, two government programmes for the old which many Republicans would like to reform (ie, restrain).

The Republican campaign unfolds against a backdrop of intense distrust of Mr Obama among conservatives. Some of this is nutty: conspiracy theorists have decided that an army exercise in Texas is the precursor to a federal takeover. The governor, Greg Abbott, who should know better, has asked the state guard to monitor it. On May 5th Ted Cruz, a Texan senator and presidential candidate, said he understood people's concerns, though he personally did not doubt the Pentagon's explanation that the exercise was just an exercise. Rick Perry, a former governor of Texas who may also run for president, dismissed the conspiracy theory out of hand. ■

David Goldberg

# The first man of Silicon Valley

SAN FRANCISCO

**A feminist icon for the tech world**

OUTSIDE Silicon Valley, few people would have recognised David Goldberg's name. But millions read about him in "Lean In", a popular book about how women can do better in the workplace. It was written by his wife, Sheryl Sandberg, the number-two executive at Facebook.

Ms Sandberg writes that the most important career choice a woman makes is whom she marries. A supportive spouse can help you excel; a jealous or lazy one may hold you back. Mr Goldberg, who died on May 1st, was one of the former. He gave his own stellar career (digital-music entrepreneur, Yahoo executive) lower priority than his wife's even more stellar one. He left a job in Los Angeles to be in the Bay Area, where Ms Sandberg was a rising star at Google. He ran SurveyMonkey, an online-polling firm. When Ms Sandberg was offered a job at Facebook in 2008, he coached her to negotiate for a better pay package.

When their first child was born Ms Sandberg had hurt her leg and was on crutches, so Mr Goldberg took charge of the baby for the first week. He and his wife made an effort to be home early for dinner; both of them would continue working after the children had gone to bed. When a friend boasted he had been playing football when his wife gave birth (some men in the Valley are rather hands-off), Mr Goldberg scolded him for his inattentiveness.

It is hardly unusual for a billionaire to have a supportive spouse. Rich men have had them for generations. It is easier to succeed in the first place if you are part of a team, and the super-wealthy do not have to put up with unsupportive mates—they can always find another.

Nonetheless, people saw the Sandberg/Goldberg household as a model of modern feminism. Female superstars are still rare in Silicon Valley, and macho behaviour is still common. Mr Goldberg was often asked how he felt about living in his wife's shadow; he made it clear that he was delighted by her success.

He died after collapsing on a treadmill while on holiday in Mexico. He was 47.

**In happier days**

Curbing Islamist extremism

# The siren song of IS

MINNEAPOLIS

**Why young midwestern Somalis try to join Islamic State**

ON May 3rd two Muslim men with rifles attacked a security guard at a venue in Texas showing cartoons of the Prophet Muhammad. Both were shot dead before they killed anyone—they were incompetent terrorists, fortunately. The Islamic State claimed responsibility for the attack. There is no evidence that it had any direct involvement, but the gunmen may have been inspired by the global jihadist movement. One of them, Elton Simpson, was questioned by the FBI in 2010 and later convicted of lying to them. He denied that he had made plans to go to Somalia and become a jihadist, when in fact he had.

For Richard Stanek, sheriff of Hennepin County, Minnesota (which covers most of Minneapolis), the story is all too familiar. For eight years he has been searching for the "magic trick" to stop young men from joining Islamic extremists, especially in Somalia. He has been called as an expert witness before Congress and shared his insights with officials from 38 countries.

Since the 1990s more than 100,000 Somalis have come to America as refugees. Many settled in the Minneapolis-St Paul area, which today is home to around 75,000 immigrants from Somalia and their children. The Cedar-Riverside neighbourhood in the Twin Cities is sometimes called "Little Mogadishu". After they arrived, Somalis clustered and kept to themselves; many intended to return home as soon as the civil war was over. Somali women made little effort to learn English.

Since Mr Stanek became sheriff in 2007, several dozen young Somali-American men from Minnesota have disappeared to join the Shabab, a group of Islamist fighters in Somalia linked to al-Qaeda. But "It really hit home in 2009, when Shirwa Ahmed blew himself up outside of Mogadishu," the sheriff says. Ahmed was the first known American suicide-bomber—and a graduate of a Minneapolis high school.

Over the past two years the danger has increased, as young Somali men, and some young women, attempt to join Islamic State (IS) rather than the Shabab. Yet Mr Stanek feels more confident. His relationship with the Somali community has much improved. He has made friends with a local imam, hired Haissan Hussein to be the first Somali deputy sheriff in Minnesota, and created a six-member team to build "communities of trust" with Hennepin County's many cultures. The team includes Abdi Mohamed, a Somali who immigrated in the 1990s, whose full-time job is to liaise with Somalis. And Minneapolis has become one of three pilot cities for Countering Violent Extremism (CVE), an initiative by the Obama administration under which police try to connect with Muslim groups through local events, mentoring and youth programmes.

Death in Dallas

These closer contacts, says Mr Stanek, are the reason why federal authorities know much more about the six young Somalis from Minnesota who were arrested trying to obtain false passports and were charged on April 19th with trying to leave America to join IS. That success, he says, is proof that many of the parents of youngsters who are at risk realise that their interests are aligned with those of the police.

Life in Minnesota

Even so, according to Andy Luger, the top federal prosecutor in Minnesota, recruitment for terror and *jihad* remains a particular problem in the state.

On a sunny morning this week, Mr Mohamed, Mr Stanek's liaison officer, walked into a Starbucks café in Seward, another neighbourhood where many Somalis live, and was warmly greeted by an all-male Somali clientele sipping coffee. He sat down with Yusuf, who came to Minneapolis in 2003 and works in a chemistry lab as well as mentoring children after school. "One problem is the generational gap between parents and children," says Yusuf. The culture and identity of home and the outside world don't fit together. Another problem is absent fathers, either not around at all or working so hard to make ends meet that they are hardly ever home.

Somalis are one of the most troubled groups of immigrants. Many young Somali men are in prison; many Somalis of both sexes drop out of high school. Unemployment hovers around 21%, the highest of Minnesota's five largest immigrant groups. More than half of Minnesota's Somalis are poor. Many are isolated from other immigrants and even from other Muslims, who find them prickly, proud and standoffish.

No clear pattern of IS recruiting in Minnesota can be discerned. The six who were recently arrested were largely self-radicalised through the internet or lured by "peer-to-peer" recruiting: a process by which friends persuade friends to join a terrorist group, compare notes on how to raise money for a flight, and make connections with middlemen in Turkey. One of the young men, Guled Ali Omar, was the brother of a would-be jihadist who left for Somalia in 2007 and remains a fugitive.

No mastermind recruiter seems to have been at work, though Abdi Nur, a young Somali from Minneapolis who joined IS last year and is now in Syria, seems to be wooing midwestern jihadists. IS's military success—it claims to have restored the old Caliphate—is probably its most potent recruiting tool. Ayaan Hirsi Ali, a Somali-born writer who was once a zealot but now campaigns for a liberal Islamic reformation, says she would probably have joined IS, had it been around when she was young and impressionable.

Somalis feel targeted both by the extremists, who lure away their children, and by non-Muslim Americans, who suspect them of terrorism, says Jaylani Hussein of the Council on American-Islamic Relations in Minnesota. They are especially fearful of CVE, which they think will amount to a giant spying operation camouflaged as social services. Mr Stanek agrees that "countering violent extremism" sounds confrontational—but he would happily take the promised federal funds and expand his community-engagement team from six members to twelve. ■

# Lexington | The new culture war

**If gay marriage triumphs, liberals should take care not to rub it in**

AHEAD of this summer's Supreme Court ruling on gay marriage—which could legalise such weddings in all 50 states—a new "gotcha" question has emerged on the 2016 campaign trail. Republican candidates are asked: "Would you attend the same-sex nuptials of a loved one or friend?" It says a lot about fast-changing public opinion that so many say they would, even if some doubt that gay people have a constitutional right to wed.

As recently as his first presidential campaign in 2008 Barack Obama claimed to oppose gay marriage on religious grounds, only formally embracing such unions in 2012. Yet last month the president felt confident enough to tease Rick Santorum, a primly conservative Catholic and one of the Republicans' few putative White House hopefuls to insist that he would decline any invitation to a gay marriage. "To which gays and lesbians across the country responded: 'That's not going to be a problem'," scoffed Mr Obama. "Don't sweat that one."

Ambitious politicians sense a shift in the national mood that runs ahead of dry poll numbers. Many Americans still tell pollsters that they oppose same-sex marriage in principle. Republicans, old people, evangelical Christians and non-whites are particularly likely to have qualms (just 42% of blacks support such unions, for instance). Nonetheless, many of those same sceptics would think a politician weirdly judgmental and unkind to snub a friend or relative's gay wedding—not least because a growing number of Americans realise that they have gay nephews and neighbours of their own. Put another way, many Americans are ready for a truce in the culture wars that surround gay rights.

Alas, at the very moment when the public seems ready to move on, there are signs that gay rights could spark a new round of cultural combat. The alarm is being sounded by moderate legal scholars and theologians who have spent years pondering fights over religious liberty and how to protect it within a legal order built around equality.

A warning call was delivered on May 4th by John Inazu of Washington University School of Law in St Louis, at the Faith Angle Forum, a twice-yearly gathering of academics, religious leaders and political journalists. A shadow hangs over traditional Christian colleges, non-profit institutions (including some large hospitals) and businesses run by those whose beliefs lead them to see gay marriage as a grave sin, notes Mr Inazu. That shadow could be termed the "Bob Jones Question"—referring to a private religious university in South Carolina whose leaders barred interracial dating or marriage until 2000, citing their interpretation of the Bible. That cost Bob Jones University its tax-exempt status, a decision upheld in 1983 by the Supreme Court.

Albert Mohler, a prominent evangelical intellectual and president of the Southern Baptist Theological Seminary in Louisville, Kentucky, has warned followers that the legalisation of gay marriage by the Supreme Court might be "the greatest threat to religious liberty of our lifetime". In an essay considering recent hearings at the court, Mr Mohler noted assurances from the lead counsel arguing for gay marriage that clergy would not be forced to perform same-sex ceremonies. But he jumped on two other exchanges involving the government's representative in court, Solicitor-General Donald Verrilli. One involved the question of whether religious schools offering married quarters would be forced to offer such housing to same-sex couples. That depends on future anti-discrimination laws, came the answer. Then a conservative justice, Samuel Alito, cited Bob Jones University and asked Mr Verrilli if a college that opposed same-sex marriage might lose its tax-exempt status. Depending on specifics in future cases, "It is going to be an issue," the solicitor-general replied.

That not only alarms folk like Mr Mohler. It makes some Republicans livid. Senator Ted Cruz of Texas talks of a "liberal fascism" attacking those who follow the Bible. In several states conservatives have proposed laws that would let firms refuse to bake cakes or supply flowers to gay weddings, and then claim a religious defence if sued for discrimination. Indiana passed and then revised such a law this year, amid protests from gay groups and businesses worried about a backlash.

Businesses that refuse service to gay weddings inspire comparisons with Jim Crow-era segregated lunch counters. By loudly supporting them, conservatives have lost potential allies. Most black Protestants disapprove of gay marriage, for instance, but six in ten of them told a 2014 Pew poll that, regardless of religious beliefs, businesses should be required to serve same-sex couples. To be fair, the left can sound intolerant, too. In Oregon last month a judge provisionally fined a husband-and-wife bakery $135,000 for refusing to cater for a gay wedding. The owners of a small pizza joint in Indiana, responding to a reporter's query, said they would happily serve gay customers but would balk at catering for a gay wedding. A deluge of threats forced them to close for a week. Some conservatives distinguish between refusing to serve customers because of who they are and refusing to endorse what they do. Baking for a gay wedding, they insist, is an expressive act: like being forced to bake a cake iced with anti-gay slogans.

**Truce, anyone?**

It would help if more Republicans were willing to pass basic laws protecting gay people from discrimination in states which lack them. At the same time, Democrats and their allies could treat faith with more respect. America has a long tradition of protecting minority beliefs through rights of free assembly and speech (Mr Inazu likes to talk of "confident pluralism"). Such rights have in recent years protected Christian groups on liberal campuses and gay groups in conservative spots, and remain a valuable means of bridging deep divides. If the summer brings the nationwide legalisation of gay marriage, liberals should be magnanimous in victory. ■

Also in this section



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Bolivia's access to the sea

# Beaches of the future?

THE HAGUE

**A South American border dispute has implications for international law**

BOLIVIA has a navy. Merchant vessels sail the high seas under the Bolivian flag. The country celebrates March 23rd as the "Day of the Sea". In fact, Bolivia has all the trappings of a maritime power except an actual coastline (confining its navy to lakes and rivers). It lost its littoral to Chile in a 19th-century war and has been trying to recover a piece of it almost ever since.

On May 4th Bolivia's quest entered a new phase when the International Court of Justice (ICJ) in The Hague began hearings on its demand for Chile to grant it "sovereign access to the sea", ie, territory that would reconnect it to the Pacific Ocean. The government commissioned 35 musicians to record a song, "Beaches of the Future", to drum up international support.

It faces long odds. The first hearings address Chile's objection to the whole procedure on the grounds that the court has no jurisdiction in the matter. Only if the ICJ rejects Chile's position, or defers a decision, will it consider Bolivia's claim that Chile has an "obligation to negotiate" access to the sea. That, Chile will argue, is a dangerous notion. It would overturn the treaty that ended hostilities between the two countries, and thus pose a threat to the system of treaties that undergirds much international law. If that is right, more is at stake in the Dutch courtroom than Bolivia's hankering for beachfront property.

The struggle has its origin in the exploitation of nitrates, used for fertiliser and to make saltpetre for the manufacture of gunpowder, in the Bolivian littoral, whose sparse population was mainly Chilean. Angered by an increase in Bolivian tax on nitrate miners, Chile invaded the port of Antofagasta in 1879. By the end of the four-year war it had also defeated Peru, which had allied with Bolivia, annexing its departments of Arica and Tacna (see map). In all, Bolivia lost 400km (250 miles) of coastline and 120,000 square km of territory. Peace was concluded only with a "treaty of peace and friendship" in 1904, under which Bolivia accepted the loss of its Pacific coast. In return Chile promised Bolivia "the fullest and freest" commercial transit.

Bolivia is not reconciled to the loss. The poorest country in South America, it blames its plight largely on its landlocked condition (see next page). Much of Chile's hoard of copper, its main export, lies underneath what was Bolivian soil. The commitment to free transit "is not as wonderful as Chile likes to portray," says Eduardo Rodríguez Veltzé, a former Bolivian president who is now ambassador to the Netherlands. Although Bolivia has its own customs officials and storage in Arica and Antofagasta, it complains that Chile has created an obstacle course for exporters. It subjects Bolivian cargo to unwarranted inspections, for example. Bolivia's constitution, enacted in 2009 under the current president, Evo Morales, calls access to the Pacific an "irrevocable right".


That frustrated ambition has made for a relationship with Chile that is at once prickly and intimate. The two countries' citizens can cross the border without passports, and most Bolivian goods have duty-free access to Chile's market. Despite the obstacles, two-thirds of Bolivia's long-distance trade passes through Chilean ports.

Yet liberal, outward-looking Chile has little rapport with the left-wing nationalists who currently govern Bolivia. Commerce lags behind its potential. Chilean companies, avid investors in neighbouring countries, have risked hardly any money in Bolivia. In turn, Bolivia has spurned big opportunities merely to spite Chile. A president who wanted to export gas through Chilean ports was forced out of office in 2003. In a referendum the following year, voters said Bolivia should use gas as a negotiating tool to gain access to the Pacific.

With the suit at the ICJ, Bolivia is trying a new tack. It insists that this is not an attempt to reopen the 1904 treaty, as Chile alleges. Instead, Chile "brought itself into a new kind of international obligation" by repeatedly offering Bolivia some sort of access to the sea after the treaty came into force, argues Mr Rodríguez. In 1975, for example, Chile's dictator Augusto Pinochet, fearing war with Argentina and Peru, offered Bolivia a corridor in territory that had ▸▸

belonged to Peru. Peru vetoed that plan. It has that right under the treaty that restored Tacna to its control in 1929. No matter, says Bolivia. Chile is still bound by the obligation to negotiate that its offers gave rise to.

This line of argument leaves Chilean officials aghast. It is "unheard of", says Heraldo Muñoz, who was Chile's foreign minister until the president asked her cabinet to resign on May 6th (see Bello). Bolivia is not merely asking for dialogue, which Chile would enter into, but negotiations under court order "with only one outcome". The ICJ has no business judging the matter. Both countries are parties to the Pact of Bogotá, which obliges signatories to submit disputes to international tribunals. But the pact excludes conflicts that were settled before 1948. Even if the court claims competence, Chile is confident it will not issue a judgment that would call into question borders long settled by treaty.

The ICJ is likely to rule this year on Chile's motion to dismiss the case, or to defer a decision until it considers Bolivia's claim. A finding for Bolivia would not end the saga. Negotiations would drag on, and could wind up back in court. No Chilean government would dare to surrender territory to Bolivia, at least not without compensation, perhaps in the form of a land swap. Even if Chile were willing, Peru could exercise its veto again.

If Bolivia and Chile cannot resolve the dispute, they could try to work around it. Chile admits that there is room for improvement in the free-transit regime. Some suggest it could offer Bolivia a lease on an enclave over which it would retain sovereignty, similar to China's former arrangement with Britain over part of Hong Kong. But no solution short of sovereignty will satisfy Bolivia. It "will never stop claiming", says Bolivia's man in The Hague. ■

The economics of landlocked countries

## Interiors

**Why it's better to have a coastline**

BOLIVIA'S quest to recover the coastline it lost in a 19th-century war looks like romantic folly. Much of its trade passes through Chile, and no political deal can reduce the distance between Bolivia's cities and the sea. But the loss is not just symbolic. If trade flowed freely, being landlocked would be no impediment to growth. In the real world, it is.

With a few exceptions the world's 45 landlocked countries are poor. Of the 15 lowest-ranking countries in the Human Development Index, eight have no coastline. All of these are in Africa, which is a poor region. But even compared with similar sea-front countries those without coastlines have lagged behind. Their GDP per person is 40% lower than that of their maritime neighbours.

Their most obvious handicap is in moving goods to and from ports. International treaties promise access to the oceans, but responsibility for implementing them lies with the governments of the "transit states". They have little incentive to build infrastructure that would mainly help their neighbours.

Border officials in both landlocked and transit countries often extract bribes and cause delays. According to Jean-François Arvis of the World Bank, lorries travelling to poor landlocked countries cover 250km (150 miles) a day. That is half the rate of progress of those driving just within neighbouring coastal states.

Enterprises regard landlocked trading partners as unreliable, since transit states can interrupt commerce. A strike by Chilean customs officials in 2013 caused a queue of lorries 20km (12 miles) long in Bolivia. This type of risk is especially grave in Africa, where civil strife is more common and landlocked countries often have to reroute trade at exorbitant cost. Businesses in those countries hold larger inventories to hedge against such disruptions, reducing their competitiveness.

Landlocked countries labour under historical burdens. They have weaker institutions, according to a recent paper by Fabrizio Carmignani of Griffith University in Australia. The flow of people and ideas that brought innovation to maritime countries largely bypassed landlocked ones. He calculates that Bolivia's GDP would be a fifth higher if it had kept its access to the sea.

The success of the few rich landlocked countries offers little hope to poorer ones. Switzerland specialises in finance, which does not travel by boat, and its high-end manufacturing is integrated with Europe's single market. Many of the goods it exports, such as watches, are expensive and small. Botswana, a middle-income landlocked country, exports diamonds, which are shipped by air.

Unfortunately, countries like Bolivia cannot move next to Germany or discover diamonds. Even if Chile yielded to its demand for access to the sea, Bolivia might recover just five percentage points of its "missing" GDP, Mr Carmignani reckons. Its best hope lies in becoming part of an EU-style single market. That could take another century.

Violence in Mexico

## May Day mayhem

MEXICO CITY

**The government needs a new anti-crime strategy**

ON MAY 1st the state of Jalisco in western Mexico felt like a war zone. An army helicopter was shot down with a rocket-propelled grenade. Smoke billowed from at least 11 banks and five petrol stations. Cars, buses and trucks had been commandeered to create 50-odd roadblocks in Jalisco and three neighbouring states; many were set alight. Fifteen people, including six soldiers and a government official, died in the violence.

The May Day mayhem was one of the most dramatic acts of defiance by drug gangs since an offensive against them began in 2006. It served notice that a relatively new group, the Jalisco New Generation Cartel, is willing to confront federal forces. And it called into question the federal government's strategy of dealing with gangs mainly by killing or jailing their leaders.

New Generation has its roots in two older outfits. One was a faction of the Milenio gang, a pioneer in methamphetamine trafficking, which fell apart after its leader, Óscar Nava Valencia, was captured in October 2009. The other was a branch of the Sinaloa gang, whose chief, Nacho Coronel, was killed by the army in July 2010. New Generation saw off some local competition in Jalisco. Then it consolidated its position in other states after the authorities captured or killed the leaders of the fearsome Zetas and Knights Templars.

New Generation has claimed a big role in trafficking methamphetamines to the ▸▸

A blast of cold water for the strategy

United States and cocaine to Europe, and has entered lucrative sidelines such as gun-running, kidnapping and extortion. New Generation has clashed bloodily with other groups, notably the Zetas, and has recently turned its fire on the police and army. On April 7th, the group ambushed a convoy of police on a country road in Jalisco, killing 15 and wounding five. The crackdown by the army after that outrage triggered the violence of May 1st.

"The criminal group responsible for the events today will be dismantled" just like the others, vowed Mexico's president, Enrique Peña Nieto, on Twitter. But New Generation's rise suggests that the government's approach, which gives priority to eliminating "high-value targets", is only working in some parts of the country.

Critics contend that the strategy of going after kingpins shatters their organisations into smaller groups that can be equally destructive. They have less capacity to move large quantities of drugs and avoid taking on federal forces. But they exploit and control some communities with unbridled ferocity, and rely on the complicity of corrupt politicians and businesses. The group that conspired with local police in the disappearance in September of 43 students originated in the breakup of the once mighty Beltrán Leyva gang.

The emergence of New Generation teaches a different lesson: it shows that new giants can be formed from the remnants of defeated groups. It may have miscalculated on May 1st, since it is now the federal authorities' number-one target. Analysts say they will eventually catch up with its leader, Nemesio Oseguera Cervantes, alias El Mencho. But as Mexicans in Jalisco are beginning to learn, it is not enough to eliminate the kingpins and break up their organisations. Their successors can be just as lethal. ■

## Bello | An anxious role model

**Chile needs change, but this should build on its strengths**

FOR the past quarter of a century Chile has stood out from its Latin American neighbours, enjoying political stability and faster economic growth. The centre-left Concertación coalition that ruled from 1990 to 2010 preserved the free-market economy it inherited from General Pinochet's dictatorship but gradually added better social provision. When the centre-right won power under Sebastián Piñera in 2010, it acted much like the Concertación and began to regulate market abuses.

To many outside observers Chile remains an admirable success story. Public debt and inflation are low. Only one Chilean in ten lives in poverty, while infant mortality is not much above that in the United States. Santiago, the capital, is laced not just with urban motorways but also with metro lines.

Yet Chile is ill at ease. Mr Piñera's government was dogged by massive student demonstrations calling for free education. In 2013 Michelle Bachelet, the moderate Socialist president in 2006-10, won a landslide victory on the most left-wing platform since democracy was restored, calling for a new constitution and reforms aimed at tackling pervasive socioeconomic inequality. Many in her coalition, rebranded as the New Majority and including the Communist Party, now repudiate the gradualist, consensus-building approach of the Concertación as a sell-out to the right.

In practice, Ms Bachelet's reforms are proving to be a mixed bag. An electoral reform introducing proportional representation in place of two-member districts (a Pinochet bequest which favoured the centre-right) was overdue. A cumbersome new tax law aimed at raising three percentage points of GDP to spend on education will crack down on evasion but risks discouraging investment.

Chile has the least-bad schools in Latin America, though that is not saying much. But the president chose to adopt the students' political agenda. The first of several education reforms bans school selection of pupils, bars privately run but publicly supported schools (which educate 58% of children) from making profits and will gradually replace parental top-up fees at these schools with public funding. This will eat up most of the extra tax revenue.

More important for raising standards will be the next bill, to increase teachers' salaries but subject them to evaluation, with those failing being sacked. Coming too is a labour reform, which will give more power to Chile's weak trade unions, possibly in return for more flexibility.

The left insists the reforms will turn a country run for and by a small elite into a social democracy. Many on the right and in business say they threaten Chile's success. They point to an economic slowdown, though this was mainly caused by a fall in the price of copper exports; a weak recovery is under way. More persuasively, moderates within the New Majority say that Ms Bachelet's team is less technically competent than its predecessors, and that ideology and short-term politics have replaced realism and long-term vision. Ms Bachelet has misread the national mood, they say: an expanded middle class wants not to abolish the elite but to be able to join it. That is why a majority in polls now oppose the education reform.

Recent events have added to the uncertainty gripping Santiago's political and business worlds. Whistleblowers have revealed that dozens of politicians across the political spectrum received illicit campaign donations from two business conglomerates. Some of the businessmen involved engaged in large-scale tax evasion. Far more damaging for Ms Bachelet herself was that her son and daughter-in-law seem to have used their influence to obtain a bank loan from which they made $2.5m in a questionable property deal. The president's popularity has plunged (to 31%). On May 6th she took the drastic step of asking her entire cabinet to resign.

In a country that has grown used to political predictability nobody knows who among the presidential hopefuls for 2018 will survive the financing scandal. On April 28th Ms Bachelet pledged to enact reforms of party finance recommended by a hastily convened commission. In an attempt to regain the political initiative she brought forward her plan for a new constitution, calling for a national debate from September.

Though much amended, the constitution dates back to Pinochet. For that reason, polls show that some 60% of Chileans want a new one. Some changes are certainly needed. But the process is fraught with risk. Optimists point to the strength of Chile's institutions. Pessimists see a slow slide towards Argentine-style populism. It is up to Ms Bachelet to ensure the optimists are proved right.

Also in this section





Narendra Modi's trip to China

# Seeking the Nixon spirit

DELHI

**Two bold leaders share an interest in at least modestly better relations**

THE three-day trip that India's prime minister, Narendra Modi, will make to China from May 14th to 16th is seen in some quarters as a chance to reset the relationship between Asia's two giants. Those inclined to enthusiasm note that Mr Modi is easily the most interested in China of any recent Indian leader. He first crossed the border into China many years ago, to a holy site for Hindu pilgrims; he has since returned several times to study China's rapid economic development. When he was chief minister of Gujarat state, Mr Modi was treated with lavish cordiality in China. At the time, politicians and diplomats from most Western powers, America included, shunned him. Mr Modi has not forgotten the hospitality.

He made a vow to visit China during his first year as prime minister and is fulfilling it, by a whisker. He reciprocates a visit by the Chinese president, Xi Jinping, who came to India in September. Unusually, Mr Xi stopped off in Gujarat before he made his way to Delhi. In turn, before he goes to Beijing Mr Modi will visit Shaanxi province, birthplace of Mr Xi's father, a comrade of Mao Zedong's.

Both leaders are the first in their respective countries to have been born after the second world war, with a willingness to try fresh approaches. Both like to project an image of manly strength, keen on bold strokes in policymaking and ready to do business. And at home both leaders dominate foreign affairs along with much else. And so some analysts are looking to see indications of a breakthrough between the two giants that warily eye each other across a 4,000-kilometre (2,500-mile) disputed border in the Himalayas, scene of a brief if nasty war in 1962.

In that context, the name of Richard Nixon is never far from the lips of Indian strategists. Like Nixon, Mr Modi is a right-winger, a nationalist with form—for instance, in promising to be tough on China (as well as on Pakistan, China's ally in South Asia). He is, in other words, probably better placed than previous Indian leaders to find a compromise that would settle the border dispute and make it acceptable back home. In conversation Mr Modi repeatedly emphasises the scale of his election victory last year. In international affairs, he implies, it gives him unusual latitude.

On the Chinese side, some also discern a potential for better bilateral relations. China's main preoccupation is maritime: over disputed claims in the South China Sea and rumbling disputes with Japan. China might prefer to keep India, a rising naval power, away from such confrontations. In January Mr Modi issued a striking joint statement with America's president, Barack Obama, declaring an interest in ensuring freedom of navigation in the South China Sea, way to India's east. A senior Indian official talks of India having a legitimate interest because a Chinese "noose" is tightening on its friends and trading partners around the South China Sea.

China's maritime fixation underscores the appeal of lessening worries over its terrestrial borders—at least that is the argument that some make in Beijing for seeking an agreement on the disputed border. In recent months the Indian government has talked of doubling the number of Indian soldiers near the Chinese border, and of building railways and new airports in the state of Arunachal Pradesh (which some in China call South Tibet). China does not want to be distracted by military challenges in the mountains. It adds up to some hopeful thinking about a deal.

Yet the reality is probably less encouraging. India's senior political figures and diplomats give no indication of anything out of the ordinary under way in terms of preparing for substantive border talks or of coming up with new mechanisms for dealing with the dispute. Mr Modi's travels, which will also take in Mongolia and South Korea, will emphasise economic co-operation. More trade and some Chinese investment in Indian manufacturing are the expected outcomes.

What is more, the trip will also have to be about patching up relations after Mr Xi's visit last year ended in tatters. While he was in India, Chinese soldiers crossed the disputed border, camping in remote mountain territory that Indian soldiers said was clearly theirs. In private Mr Modi was furious about being humiliated by his guest. But, intriguingly, Mr Xi may have felt humiliated too. Some military observers have been told that the commanding officer of those border guards was summarily sacked. It will be enough next week to avoid confrontation and mishaps. The Nixon moment, if there is to be one, will have to come later. ■

Pakistan's car industry

# Flop gear

ISLAMABAD

**An absurdly protected industry**

THINGS can get emotional at the main Suzuki dealership in Islamabad, the Pakistani capital. "Many of our customers literally cry when they buy their first Mehran," says Mohammad Ali Khalid, the managing director. "All their lives they have been saving up little amounts to buy this car."

Yet there is plenty more to cry about over the Suzuki Mehran, Pakistan's bottom-of-the-range car. The boxy contraption has barely changed since its debut in 1989. Taxi drivers complain that parts straight from the factory quickly have to be replaced.

The Mehran is the only small car available—and you have to wait for months to get one. At $6,250 for the basic model, it is not cheap. It costs a third more than the Indian equivalent, the Suzuki Maruti—which was phased out altogether last year.

Choice and value are also in short supply at the higher end of the market. The roads are clogged with Toyota Corollas and a few Honda Civics—almost invariably white. They are assembled locally and are years behind in offering airbags, anti-lock breaking systems and even electric windows as standard.

The industry is carved up among just three Japanese brands, Suzuki, Honda and Toyota, assembling cars with imported parts in joint ventures with local players. They enjoy the protection of high tariffs and other Byzantine rules. It is meant to encourage "indigenisation" of production.

Occasionally Pakistan's competition commission kicks up a fuss. Five years ago it warned that the "neat division of the market" allowed assemblers to adopt a "strategy of increasing profits on limited production instead of increasing volumes." Yet the industry's shrill complaints forced the commission to pull its latest damning report, published last year, from its website.

Meanwhile, a country with a population of 190m dribbles out just 116,000 cars a year. The industry is worried that the government plans to loosen restrictions on the import of second-hand cars in a bid to inject a little competition into the sector. "The government needs to make up its mind whether it wants to be a nation of traders or do you want to have a manufacturing base in this country," says Parvez Ghias, Toyota's head in Pakistan. If second-hand cars worry the industry, you know something is wrong.

Maori rights in New Zealand

# Water, water everywhere

**But no guarantee against squabbling over ownership**

UNLIKE many countries, New Zealand is blessed with abundant fresh water. Its temperate climate, regular rainfall over much of the country, and thousands of lakes and rivers ensure a good supply. But who owns these larger bodies of water? The government's answer is, no one: not the state, nor any group or individual. But some of those who have lived in New Zealand longest, the Maori, disagree.

The Maori claim a special relationship with New Zealand's fresh water, based on their historical use of its rivers for drinking water, spiritual beliefs, fishing and shellfish harvest, transport and trade, among other things. Their case goes back to 1840, when the British Crown and most of the Maori tribes signed the Waitangi treaty, which first formalised the colonists' settling of the islands. Maori rights were enshrined in the treaty. An interim ruling by the Waitangi tribunal, set up in 1975 to deal with Maori grievances about land and related issues, says that the Maori have freshwater rights "for which full ownership was the closest cultural equivalent in 1840."

Although the government has been willing to discuss water rights with some Maori groups, John Key, the prime minister, says that "full ownership" will not be ceded. In 2012 the government sought to part-privatise Mighty River Power, an electricity company with dams on the longest river, the Waikato, which has particular spiritual value for the Tainui tribe. The


Maori Council, with representatives from each Maori district, tried to have the sale stopped or postponed. But in 2013 the high court ruled in the government's favour.

Mr Key hopes the freshwater issue can be settled—through political negotiation, not in the courts—in the coming year. He must tread a careful line. Most New Zealanders dislike the idea of privatising water. But he cannot afford to refuse to negotiate with the Maori. In 2004 a Labour government overruled a court which had given the Maori title to the foreshore and seabed. After a huge protest, the Maori Party was formed, some of its members having broken away from the Labour camp. The offending law was eventually unpicked. Today Mr Key's National Party leads a minority government which relies on the Maori Party for occasional support.

One proposal is that the Maori get a ▸▸


Our waka, our waters

specified water allocation from regional councils, just as farms do. But Federated Farmers, a lobby group, argues that all available water has already been allocated and that specifying a share for the Maori would mean others losing out. New Zealand's farms rely heavily on water—especially in the dairy sector, which is now the country's biggest export earner, worth $10 billion a year.

Growing Chinese demand for milk powder means farmers are increasingly switching from meat production to dairy, thereby increasing their water use. Dairy farming is also polluting freshwater supplies, as phosphates and nitrates seep into groundwater. This has become a political issue, not just for the Maori: many of the rivers and lakes loved by all Kiwis are no longer safe to swim in. The most likely outcome is a fudge that avoids saying anyone owns New Zealand's fresh water. But the Maori may get more influence over some water, or even an allocation. ■

Politics in Cambodia

# The faithful couple

PHNOM PENH

**An unlikely rapprochement after a long stand-off**

AFTER Hun Sen bet $5,000 on Manny Pacquiao defeating Floyd Mayweather in boxing's "fight of the century", the Cambodian prime minister refused to pay up, arguing that the Philippine hero did not deserve to lose to Mr Mayweather on points. So far, so usual for Cambodia's strongman: boxing is just like an election, really, only less violent. The opposition has long claimed that Mr Hun Sen's ruling party stole the last election, and there has been blood on the streets since.

So what to make of the unusual: the recent spectacle of Sam Rainsy, the opposition leader, consorting with Mr Hun Sen, his nemesis who has ruled Cambodia for 30 years and who drove Mr Sam Rainsy into exile for the better part of a decade?

Mr Sam Rainsy's Cambodia National Rescue Party (CNRP) had been in a standoff with Mr Hun Sen's Cambodian People's Party (CPP) since the election in 2013. A parliamentary boycott and a series of street protests followed, as well as a violent government crackdown on dissidents. An uneasy truce was negotiated last July. Yet last month, in plain view near the temples of Angkor Wat, here were Mr Sam Rainsy and Mr Hun Sen celebrating the Cambodian new year together along with their wives, chatting amicably to locals.

So far as Mr Sam Rainsy is concerned, there is now sweetness and light. "I used to hate Hun Sen," he says. "But then it came to my mind that I should not hate anyone as a human. I should only hate and combat any bad crimes that a person has committed." Mr Hun Sen has had an epiphany too: he and Mr Sam Rainsy "must stay together because, at the very least, we have the same Cambodian blood."

How long the amity will last is unclear, but for now it is a marked change. Several opposition politicians have been released from jail. The CNRP will be allowed its own television station as an antidote to the state-run media. And the party will have more chairmanships of parliamentary committees as well as seats on the National Election Committee, whose apparent bias in favour of the CPP was a chief grievance at the last election. The next election must be held by 2018, and on the face of it the opposition should fancy its chances. After all, despite voting irregularities and the state's apparatus put to the service of the ruling party, the CNRP fared remarkably well in 2013, winning 44.5% of the vote and 55 seats versus the CPP's 48.8% and 68 seats—down from 90 seats in the previous election. For Mr Hun Sen that result was a blow: his party had kept a firm grip on power since Vietnam invaded Cambodia and ousted the Khmers Rouges in 1979.

The rapprochement has displeased many in the CNRP. Detractors took to social media, accusing Mr Sam Rainsy of being driven by ego and the prospect of a cosier life as a puppet of Mr Hun Sen's. An assistant to Kem Sokha, the opposition's vice-president, accused Mr Sam Rainsy of having accepted a very large bribe. Mr Sam Rainsy denies it. He says it was simply time to end "a culture of war, a culture of confrontation, a culture of revenge". Dialogue, he said, was needed.

A friend of Mr Sam Rainsy argues that this is a notable moment, when Cambodia's dictator has accepted that a winner-takes-all politics no longer serves, and that power now needs to be negotiated—with prosperity spread beyond a narrow, grasping elite. Yet previous detentes under Mr Hun Sen have not ended well. Funcinpec, Cambodia's royalist party, entered a coalition with the CPP only to see its influence wane so rapidly that it won no parliamentary seats at all in the 2013 elections. Mr Sam Rainsy has proclaimed a "culture of dialogue" once before, when he returned from exile in 2006—only to flee again four years later. Sophal Ear at Occidental College in California compares Cambodian politics to a game of cat-and-mouse "where only the mouse changes".

But the cat still has to run for re-election, and the next one, which Mr Hun Sen and Mr Sam Rainsy both say they will contest, already looms. Mr Hun Sen is 62 years old, and has said that he intends to rule until he is 74. Yet Cambodia's young electorate is tired of decades of corruption and thuggish rule. Even with all the resources at its disposal, the CPP may not win the next election outright and deals may need to be cut. Prince Norodom Ranariddh, who heads Funcinpec, also says he plans to run but, given his party's abysmal showing in 2013, he offers the prime minister little. Mr Kem Sokha's frequent and unflinching criticisms of the prime minister render him an unlikely partner. That leaves Mr Sam Rainsy as the most appealing choice.

Mr Sam Rainsy says he will not consider a coalition. He says that if he wins, he will launch an investigatory committee, modelled on South Africa's Truth and Reconciliation Commission, into allegations of corruption levelled at the CPP. It has prompted Mr Hun Sen to bare his teeth, warning Mr Sam Rainsy that if he "does not let me live comfortably…I have forces that can fight back, that will make him live not comfortably either." So much for a new culture of dialogue. ■

Hun Sen (left) with Sam Rainsy: their new silken road

# Banyan | Who's afraid of the activists?

**Democratic Asian governments as well as authoritarian ones crack down on NGOs**

IN Central Asia officials claim that non-governmental organisations are "battering-rams" that damage national sovereignty. In China a new law restricting independent organisations is being drafted, as activists are hounded, including five women recently detained for more than a month for campaigning against sexual harassment. And Cambodia's rulers say they must "handcuff" any NGOs that stir up political trouble. You would expect authoritarian states to suffer from NGO-aversion. But many of the ostensibly more liberal Asian polities also display the symptoms, especially where prickly nationalists are in charge. When Sri Lanka's defence ministry took charge of regulating NGOs, it was described as a necessary guard against traitors. Last month India's prime minister, Narendra Modi, snarled that "five-star activists" were bent on doing down his country. A new law in Indonesia imposes tight restrictions on NGOs so as not to "disrupt the stability and integrity" of the country. And three years ago Pakistan closed down Save the Children and booted out its foreign staff, saying that spies all too often masquerade as aid-workers.

Hostility to NGOs is not new, nor is it unique to Asia. But it is getting more intense and pervasive in the region—including among democracies. Tighter regulation is leading to a clampdown on outfits that governments dislike.

One official grumble is that charities are often proselytisers of unwelcome religions. In India, Hindu nationalist outfits, notably the giant Rashtriya Swayamsevak Sangh (RSS), rage at Christian charities. The boss of the RSS insists that the late Mother Teresa cared more about converting Kolkata's poor than helping them. The Indian home ministry says that $13 billion in foreign money has gone to local charities over the past decade. Of the top 15 donors, 13 were Christian outfits. Who is to say they were not saving souls rather than improving lives? It is common to hear such claims in India.

An overlapping complaint is that groups promote Western values—including the idea that power should be monitored and shared among many actors and institutions, not hoarded by governments. The authorities have hassled groups that train election monitors in Kyrgyzstan or promote land rights in Laos. Charities that talk up gay rights, prison reform or abolishing the death penalty are accused of serving Western interests. When Human Rights Watch, a New York-based group, pointed out flaws in war-crimes trials in Bangladesh, it was slapped with legal charges and accused of meddling.

A third broad allegation is that NGOs are fronts for leftists and environmentalists set on weakening Asian powers and scuppering development. A leaked report by India's Intelligence Bureau claimed—absurdly—that "people-centric" campaigns against coal, nuclear and hydroelectric projects and against GM crops were costing the economy 2-3 percentage points of growth a year. In January Indian officials stopped a Greenpeace activist from leaving the country because she planned to testify to British parliamentarians about coal mining in India. The hostility predates Mr Modi. His predecessor, Manmohan Singh, pushed through a law regulating 45,000 foreign-funded groups. He accused American NGOs of being the black hands behind anti-nuclear protests.

Countries do not mind foreign influence if it provides inspiration for crackdowns. Both Kyrgyzstan and Tajikistan are drafting laws modelled on a Russian one, passed in 2012, against "foreign agents". When Sri Lanka was run, until this year, by the family of the then president, Mahinda Rajapaksa, the government intimidated groups training Tamil journalists. Their methods owed something to Chinese-style restrictions on public debate. At a time when Chinese influence on the island was growing, close scrutiny of Chinese investment by independent groups was discouraged. Things have relaxed since a change of government.

Rule by a strongman, or -woman, invariably involves attacks on NGOs. In Cambodia, Hun Sen, who has ruled for 30 years, said he would not put up with charities "cursing" the ruling party. In Bangladesh, Sheikh Hasina's officials harass not only human-rights groups but also the Grameen Foundation, which channels its energies squarely into development (though its founder, Muhammad Yunus, incurred Sheikh Hasina's wrath when he considered a political career). In India last month nearly 9,000 NGOs were told they could no longer get foreign funds. One group has come under notable pressure because of Mr Modi's past: the Ford Foundation is under scrutiny for giving funds to an activist, Teesta Setalvad, who campaigned for the prosecution of those behind a pogrom against Muslims in Mr Modi's Gujarat state, in 2002.

### Chilling, in a bad way

Intimidation can prove effective. But it draws attention to governments' own shortcomings. Pakistan's claim that spies masquerade as aid-workers, for example, mostly reflects its own irregular behaviour. Four years ago its spy agency was exposed for illegally funding a supposedly independent charity in Washington that criticised human rights in Indian Kashmir. Now India is the one earning a bad reputation. On May 6th America's ambassador in Delhi, Richard Verma, spoke of his "deep concern" over harassment of NGOs, saying it had a "chilling effect" on democracy.

Mr Modi may not care. But in the long run, such harassment only rallies political opponents. And as countries grow richer and aspirations rise, NGOs will grow only more influential in helping to promote social equity and civil rights. Those now advocating tighter scrutiny of activist outfits may come to regret it. In India, for example, Hindu nationalists in the RSS often claim to run the world's biggest NGO. It has strong foreign links, draws on an Indian diaspora in America and elsewhere for support, and dishes out help across borders, such as in Nepal following last month's earthquake. It may face close scrutiny itself one day, when Mr Modi is gone. Battering-rams, after all, have two ends. ■

Also in this section



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Russia and China

# An uneasy friendship

**The crisis in Ukraine is drawing Russia closer to China. But the relationship is far from equal**

THE celebrations in Moscow on May 9th to commemorate the capitulation of Nazi Germany 70 years ago will speak volumes about today's geopolitics. While Western leaders are staying away in protest against Russia's aggression in Ukraine (and the first annexation of sovereign territory in Europe since the second world war), China's president, Xi Jinping, will be the guest of honour of his friend, Vladimir Putin. Western sanctions over Ukraine, and what looks set to be a long-term chilling of relations with America and Europe, has given Russia no option other than to embrace China as tightly as it can.

Next week, in a further symbol of the growing strategic partnership between the two countries, three or four Chinese and six Russian naval vessels will meet up to conduct live-fire drills in the eastern Mediterranean. The exercise, which follows several similar ones in the Pacific since 2013, aims to send a clear message to America and its allies. For Russia the manoeuvres signal that it has a powerful friend and a military relationship with a growing geographic reach. For China even a small-scale exercise of this kind (its ships are coming from anti-piracy duty in the Gulf of Aden) speaks of increasing global ambition in line with Mr Xi's slogan about a "Chinese dream", which he says includes a "dream of a strong armed-forces".

At a more practical level, the exercise provides a shop-window for China's Type 054A guided-missile frigate, which it would like to sell to the Russians. It also offers operational experience in an unstable region in which it has an expanding economic presence. In 2011 China organised the evacuation of more than 38,000 Chinese from Libya during that country's upheaval. Last month its navy pulled several hundred of its citizens out of Yemen, which is being torn apart by civil war. There are thought to be at least 40,000 Chinese working in Algeria and more than 1m across Africa.

Relations between China and Russia have been growing closer since the end of the cold war. Both, for different reasons, resent America's "hegemony" and share a desire for a more multipolar world order. Russia, a declining great power, is looking for ways to recover at least some of its lost status; whereas China, a rising power, bridles at what it sees as American attempts to constrain it. As fellow permanent members of the UN Security Council, both with autocratic governments, Russia and China find common cause in sniping at Western liberal interventionism. The two countries settled all of their long-standing border disputes in 2008, just a month before the Russian-choreographed war in Georgia. Russia saw the deal as a way for it to concentrate more of its military forces in the west as a deterrent against the further expansion of NATO.

But there have been occasional tensions. Russia played a key role during the 1990s in helping China to modernise its military forces. Russia was able to preserve a defence-industrial base that would otherwise have withered from lack of domestic orders. But since the middle of the last decade, irked by China's theft of its military technology and its consequent emergence as a rival in the arms market, Russia's weapons sales to its neighbour have slowed.

Russia is also wary of becoming little more than a supplier of natural resources to China's industrial machine—a humiliating position for a country that until recently saw China as backward. As long as Russia could sell to Europe all the gas required to keep the Russian economy growing, it could put deals with China on hold. These included plans for two gas pipelines from Siberia into China that were announced in 2006 and then quietly dropped as the two sides bickered over prices.

All that has changed. The Ukrainian crisis is, as Russian media put it, forcing Russia to "pivot" its economy towards Asia in an effort to lessen the impact of Western sanctions by finding alternative markets and sources of capital. For China it is a golden opportunity to gain greater access to Russia's natural resources, at favourable prices, as well as to secure access to big infrastructure contracts that might have gone to Western competitors and to provide financing for projects that will benefit Chinese firms. ▸

In theory, Russia's incursions into Ukraine and its seizure of Crimea violate two of China's most consistently held foreign-policy tenets: non-interference in other states and separatism of any kind. But China abstained from voting on the UN Security Council resolutions condemning Russia, while Chinese media have given Russia strong support. China has quietly welcomed a new cold war in Europe that might distract America from its declared "rebalancing" towards Asia.

Striking evidence of the new closeness between China and Russia was a $400 billion gas deal signed in May last year under which Russia will supply China with 38 billion cubic metres (bcm) of gas annually from 2018 for 30 years. At China's insistence, the gas will come from new fields in eastern Siberia and will pass through an as yet unbuilt pipeline—the better for ensuring that it will not be diverted elsewhere. Other deals have followed. The biggest was a preliminary agreement signed in November for Russia to sell an additional 30 bcm a year through a proposed pipeline from western Siberia. In every instance it is probable that China was able to drive a hard bargain on price.

Russia's weakness was also clear in its recent decision to resume high-tech arms exports to China. In April it agreed to sell China an air-defence system, the S-400, for about $3 billion. This will help give China dominance of the air over Taiwan and the Senkaku islands (Diaoyu to the Chinese, who dispute Japan's claim to them). In November Russia said it was prepared to sell China its latest Sukhoi-35S combat aircraft. Initially it had refused to sell any fewer than 48, in order to make up for losses it calculated it would suffer as a result of China's inevitable pilfering of the designs. Now it has meekly agreed to sell only 24.

But problems ahead are discernible. One is that both countries are competing for influence in Central Asia, once Russia's backyard (Mr Xi was due to head there before proceeding to Moscow). Mr Putin wants to establish his Eurasian Economic Union partly to counter growing Chinese economic power in Central Asia, through which China wants to develop what it calls a Silk Road Economic Belt. China is using the Shanghai Co-operation Organisation (SCO), of which Russia and Central Asian nations are also members, to boost its security ties in the region as well: it often holds counter-terrorism exercises with its SCO partners. Another difficulty is Russia's military and energy links with countries such as India and Vietnam, both of which are rivals of China. But the biggest problem of all may be Russia's irritation with being forced into an increasingly subservient role in its relations with China. For Russia the partnership with China has become painfully necessary. For China it is nice to have, but far from essential. ■

Music

# Mosh no more

BEIJING

**Amid a drive to encourage cultural orthodoxy, rebellious rockers worry**

CRACKDOWNS in China often unfold without explanation, carried out by officials acting on directives that never see the light of day. A veteran journalist, Gao Yu, was jailed last month for seven years for revealing the existence of a campaign against the discussion of Western political ideas. The Communist Party document that ordered it was a state secret, the court ruled. Rock musicians, at least those of a more rebellious stripe, therefore have had cause to worry of late. Even at the best of times their concerts are prone to cancellation by officials for unclear reasons. In recent weeks, however, this has been happening more often than usual. Many suspect the party of losing patience with rock music's more rebellious fringe.

The 330 Metal Festival had been held without a hitch since 2002. This year the daylong bash was, as usual, to have featured heavy-metal bands whose very names sound calculated to annoy the party's prudes: Crack, Massacre of Mothman and Suffocated (330 refers to the birthday on March 30th of the festival's organiser, a guitarist with Suffocated). But a few hours after the event opened—two days before the guitarist's birthday—the police arrived at the venue, a nightclub in Beijing called Tango. They demanded the festival be shut down for safety reasons.

The police may have been right to worry. There were 1,300 people dancing inside. Many took part in a routine called *siqiang* ("wall of death") in which audience members divide into two groups and charge at each other. Memories are fresh of a stampede by outdoor revellers in Shanghai on New Year's Eve that left 36 people dead. Officials have been more cautious since then about large public events.

But the police action came at the end of a particularly bad month for rock music's rougher elements. The authorities had cancelled a tour by Makoto Kawabata, a Japanese artist (a tour by his band, Acid Mothers Temple, was also cancelled last year because its music was deemed "pornographic and occult"). Officials had also pulled the plug on The Boys, a British punk group (a lack of "decency" was said to be its problem). Boris, a Japanese band, had performed in Shanghai but had been stopped from doing so elsewhere, including Beijing (too "revolutionary" was the pretext—and not in a good Communist way).

Then in April came the announcement that Beijing's two biggest rock festivals, Strawberry and Midi, which are held every year during the May Day holiday, were being "postponed" indefinitely. Officials said the venues were not suitable for large crowds (a separate Strawberry festival did go ahead a few days earlier in the central city of Wuhan, however, and another in Shanghai during the holiday—see picture).

It may be that ensuring safety was indeed a reason for some of the closures. But officials are trying to tighten control over culture generally. In October President Xi Jinping said the arts should "embody socialist core values" (it is safe to assume that he does not share the fondness of his Indonesian counterpart, Joko Widodo, for Napalm Death, a British heavy-metal band). Mr Xi was probably not thinking of Suffocated, and those who mosh to its angry sounds, when he said that artists should "take the initiative to breathe with the people". He would not, however, need to look up the word mosh: a common rendering in Chinese is *kuangwu*, meaning "wild dancing", which sounds suspicious enough. ■


**Strawberry fields, forever?**

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America, Iran and the Gulf

# Obama shakes up the sheikhs

**Gulf leaders are alarmed by America's nuclear deal with Iran, and are seeking new security guarantees**

BARELY a day passes when Binyamin Netanyahu, the Israeli prime minister, does not bemoan the "bad deal" that America is negotiating with Iran to curb its nuclear programme. There is no such overt hostility from leaders of the Arab monarchies of the Gulf, who have publicly welcomed the progress made so far. Within their gilded palaces, though, the kings, emirs, sultans and sheikhs are just as alarmed as Israel. In return for their silence, they want America to make a big new commitment to their security.

Forget President Barack Obama's declared hope that the nuclear accord may lead to a broader rapprochement with Iran, say Gulf leaders; ignore the sweet talk from Mohammad Javad Zarif, the Iranian foreign minister, who says the deal could be the starting point for more stable regional security arrangements. Pay heed instead to the sayings and doings of Iran's Revolutionary Guards: they call for the downfall of Saudi rulers and seized for some days a container ship passing through the Strait of Hormuz (see next story).

Gulf leaders believe the nuclear deal, which will lift most economic sanctions against Iran, will release tens of billions of dollars' worth of frozen assets and free up trade and investment, allowing Iran to meddle even more than it already does in the conflicts of Iraq, Syria, Lebanon and Yemen, and perhaps to stir up Shias in Bahrain and eastern Saudi Arabia too. "The agreement gives the impression that Iran can be a regional hegemon," says one senior Gulf official. "The regime is embattled financially, but it has nevertheless been pushing aggressively. Now it will have recognition and financial solvency. This is a serious worry for us."

So when leaders of the six members of the Gulf Co-operation Council meet Mr Obama at the White House and then at Camp David on May 13th-14th, he will face demands that America provide advanced weapons to guarantee the Arabs' military superiority over Iran, which may soon be able to buy more Russian and Chinese arms. Satisfying them while also keeping the promise to maintain Israel's superiority over the Arabs will be tricky. Some reports say Mr Obama will go no further than to revive a call for the Gulf states to construct their own region-wide defence system to ward off Iranian missiles.

A more awkward plea is that America should agree to a pact with the Gulf states to protect them against Iranian encroachment. The Arabs would like a formal treaty, but know that is unlikely as it would have to be ratified by a Republican-controlled Senate. They are pushing instead for a "memorandum of understanding". How far Mr Obama will go in meeting this demand is unclear.

To varying degrees, the Gulf's Sunni leaders have long regarded Iran with suspicion. But their alarm has grown with the chaos that has felled one Arab regime after another. The vacuum has been filled by both jihadist groups and proxies of Iran. In Iraq and Syria, Iran has become directly involved in preserving friendly governments. It has relied heavily on its Lebanese client, Hizbullah, a militia-cum-party that has been fighting in Syria and has helped train Shia forces in Iraq. With the collapse of its main Arab foes, Israel now sees Hizbullah as its greatest near-term threat.

Under King Salman, who came to the throne in January, Saudi Arabia has cast off its habitual caution. Heading a coalition of Sunni states, it launched an air campaign in Yemen in March after the toppling of the government of Abd Rabbo Mansour Hadi, who now wants ground forces too. Gulf officials say they have been compelled to act to stop Iran turning Shia Houthi rebels into a Yemeni version of Hizbullah.

Iran may not fully control the Houthis, but Iran and its allies have undeniably taken up their cause. Ayatollah Ali Khamenei, Iran's supreme leader, has accused Saudi Arabia of committing genocide. The commander of Iran's Revolutionary Guards has declared that the House of Saud "is teetering on the edge of collapse".

Seeking to consolidate the Sunni camp, Saudi Arabia has sent conciliatory signals to the Muslim Brotherhood, whose members have been crushed in Egypt, and has drawn closer to one of its sponsors, Turkey. That may discomfit more hawkish allies, especially the United Arab Emirates, who regard the Brotherhood, even in non-violent incarnation, as the source of jihadist ideology. But in Syria, regional co-operation seems to be one factor behind the recent battlefield successes of rebel groups (see page 40); some think the Saudis and ▸▸

Iranians may soon strike a deal on Syria.

In a sense, such assertiveness is what Mr Obama has wanted to encourage as he has reduced America's role in the region. But it is still America that guarantees free navigation in the Gulf. And there are signs that, even as it backs the Saudi-led action in Yemen with intelligence and logistics, America is worried by its consequences.

One reason why the Saudis scaled down the air campaign, says the Gulf official, was to assuage America, which feared that the strikes would upset the negotiations with Iran, and create more space for al-Qaeda in Yemen. As he seeks to reassure anxious Gulf leaders while simultaneously negotiating with Iran, Mr Obama has yet to explain what he thinks America's role should be in an ever more sectarian-flavoured contest for regional dominance. ■

Middle East sea lanes

# Oil on troubled waters

PORT SAID

**The region's wars and rivalries have not hurt maritime trade—so far**

JUST off the coast of Port Said is an example of orderly behaviour that belies the often chaotic nature of life on land in Egypt. As the world's container ships approach the northern opening of the Suez Canal, they form a majestic queue in the Mediterranean Sea, where they wait before gliding through the narrow passage.

In recent years the shipping lanes of the Middle East, notably the Suez Canal, the Bab al-Mandab strait and the Strait of Hormuz (see map), have remained largely immune from the wars and rivalries of the countries that surround them. Even Iran's mysterious seizure of a container ship off its coast on April 28th has done little to disrupt the flow. Shippers have grown accustomed to the volatility and believe the gatekeepers of crucial sea lanes have too much to lose by blocking them.


Not for the first time, Iran is testing that belief. One-fifth of the world's oil trade slips by its coast along the Strait of Hormuz. Since it exports so much oil, impeding that traffic might seem self-defeating. But Iran has threatened to close the waterway before, most recently in 2012 in response to Western sanctions. And while officials in Tehran have linked the seizure of the container ship to a commercial dispute, many see it as mischief-making. The ship was released on May 7th, but the incident prompted America to deploy warships to watch over American-flagged vessels entering the strait, a practice since stopped.

Iranian ships have also shadow-boxed with American and Arab forces around the busy Bab al-Mandab, the strait leading into the Red Sea and the Suez Canal, through which around 10% of all sea trade passes. In mid-April an Iranian convoy looked set to run a blockade of Yemen enforced by a Saudi-led coalition that is bombing the country. Some think the ships were to supply the Houthi rebels, who are targets of the air-strikes. But the Iranians backed off when America sent an aircraft-carrier to the area. Iran has since positioned two of its destroyers at the entrance to the Bab al-Mandab, ostensibly to fight piracy.

Analysts have puzzled over Iran's intentions, but the industry has remained unperturbed. Maersk, the Danish shipping giant that chartered the vessel seized by Iran, says the action was unjustified, but calls it an "isolated incident". It has not changed its routes or security guidance for ships in the Middle East. Nor has the volatility hurt other firms. "We are seeing pretty much undisrupted shipping activity," says Peter Sand of BIMCO, the world's largest international-shipping association.

Dealing with uncertainty has become a normal part of business for shippers transiting the Middle East. Crews are often paid a premium. Maritime-security services assessing the routes reckon that fighting on land is unlikely to spill into the sea. The calm is reflected in insurance rates, which have not risen in response to recent events.

Even so, some countries are trying to enable ships to avoid Iran. Rattled by its threats in 2012, Saudi Arabia and the United Arab Emirates opened new oil pipelines that bypass the Strait of Hormuz. The six states of the Gulf Co-operation Council plan to build a railway from Kuwait to Salalah in southern Oman, where goods could be loaded onto ships in the Arabian Sea. But the pipelines can carry only a portion of the Gulf's oil, and the railway, due to open in 2017, is expected to face delays.

Iran may anyway not represent the biggest threat to seaborne trade in the region. Non-state actors, which have no stake in the waterways, are more likely to disrupt them. Though once-menacing Somali pirates have been stopped by Western navies, there may be a new threat emerging from Islamist militants in Egypt's Sinai peninsula, home to a disaffected Bedouin population just east of the Suez Canal.

Egypt's security forces have struggled to deal with the militants, who stepped up their attacks after the coup against Muhammad Morsi, the former president, in 2013. An army crackdown merely alienated civilians and radicalised the fighters. The strongest group has pledged allegiance to Islamic State jihadists. It has killed hundreds of soldiers and police and also hit economic targets. The canal, which brings in some $5 billion a year, or about 2% of Egypt's GDP, is one. On two occasions in 2013, one in broad daylight, jihadists filmed themselves firing RPGs at ships passing through the canal.

Such attacks are unlikely to sink container ships, but the militants may have drawn on old tribal and smuggling webs to gain heavier weapons, most likely from Libya. America, which sends dozens of naval vessels through the canal each year, is duly worried. Were a ship to be sunk, it might shut down the canal for weeks. Re-routing around the Cape of Good Hope would add some 4,300km (2,700 miles) to the journey from Saudi Arabia to America.

Still, shippers appear unruffled. Even amid the turmoil of the Arab spring and its aftermath, there was little disruption to the canal because each successive government viewed it as a national interest. Indeed, Mr Sisi hopes to add a new lane by the end of summer. "There is still a pretty rock-solid belief that the Egyptians will defend the canal," says Mr Sand. ■

Syria's civil war

# Clinging on

CAIRO

**Bashar Assad is weaker than ever; but peace is not nigh**

IT IS hard to find a sitting ruler with more blood on his hands than Syria's Bashar Assad. The war, sparked largely by his heavy-handed response to protests in 2011, has killed over 200,000 people and displaced half the population of 24m. In the 15 months to March this year, 3,124 civilians were killed by the regime's bombs in Aleppo alone, according to an independent report this week. But now there are signs that his regime may be faltering.

A year-long equilibrium in which the regime and its backers (Iran, its Lebanese client, Hizbullah, and Russia) had the upper hand has come to an end. Last month Mr Assad lost Idleb and Jisr al-Shughour, two key towns in the north-west, to rebel fighters. On May 4th a suicide-bomber made it into central Damascus, the heavily ▸▸

**Peace cannot come too soon**

guarded capital. Latakia, the port city close to the Assads' ancestral home, is now within the range of rebel mortars.

The regime is short of men, despite its use of foreign militias. Hizbullah and Iranian forces have withdrawn from some areas in the south of the country to protect Damascus and the border with Lebanon where Jabhat al-Nusra, a rebel group affiliated to al-Qaeda, launched an offensive on May 4th. Syrian soldiers grumble about being used as cannon fodder. A recent fight between two security chiefs, the subsequent mysterious demise of one of them, and rumours that a third is ill, all hint at disagreements in the ruling cabal.

At the same time the rebels, most of whom are Islamists, have become more organised both on and off the battlefield. Several groups, including Jabhat al-Nusra, banded together as Jaish al-Fatah (Army of Conquest) to take—and try to administer rather than run into ruin—Idleb. Deraa, the southern city where Syria's uprising first began, is now within their sights. Aleppo, the recent target of a big regime offensive, now looks more likely to fall under full rebel control than into the regime's grip.

The rebels are getting more of a helping hand. Their foreign backers, whose fractious relations have long hampered the effectiveness of their support, now appear to be better co-ordinated. Saudi Arabia, more assertive under King Salman, has reached out to Recep Tayyip Erdogan, Turkey's president; co-operation with Qatar has also improved. "The takeover of Idleb was a sign of these changing dynamics," says Lina Khatib, the head of the Carnegie Middle East Centre, a think-tank in Beirut.

Is this likely to translate into an end to Syria's misery? Alas not. Militarily, it is still the case that neither side can prevail. The regime can survive by further confining its area of control to the western area of the country, where its grip is firmest.

A political solution looks just as improbable. On May 4th Steffan de Mistura, the UN's envoy to Syria, embarked on fresh talks in Geneva with parties including, for the first time, Iran. That is a step forward; but in a backward one, the parties will not meet face-to-face as they did in two previous sets of talks. Western diplomats say the aim is to take stock rather than to broker peace. "I don't see any signs of a breakthrough," says Robert Ford, who was American ambassador to Syria when the uprising started in 2011.

Mr Assad is still unwilling to make concessions, and the rebel groups refuse to let him have any role in a transition. He still argues, with a degree of justification, that he is fighting savage terrorists; he has sent diplomats to Tehran and Moscow, and gone on a charm offensive with the press.

Despite seeing Mr Assad as something of a embarrassment, there are no signs that his backers want to be rid of him yet. In a


speech on May 5th Hassan Nasrallah, Hizbullah's leader, denied any intention to desert Mr Assad; and he has reportedly predicted the demise of Hizbullah itself if Mr Assad falls. And should sanctions on Iran be lifted after an agreement on its nuclear weapons at the end of June, Mr Assad's main ally may only become more expansive. For its part, Russia has little traction with the regime.

The biggest pressure on Mr Assad may come from the economic problems affecting him and his allies. The drop in the oil price has hurt Iran and Russia. Iran has yet to provide credit to Syria this year, including $1 billion that Syria's central-bank governor says Iran promised. Damascus's desperation for cash was clear in recent announcements that private companies can bid for state assets and that Syrians can renew their passports (for a fee) without clearance by the security agencies.

The danger of complete chaos rises with every day the war continues. "State institutions have been the victims of the war," says a former Syrian official. The army, bureaucracy, hospitals and schools have given way to militias and civilians struggling to survive. If the regime suddenly unravels, there will not be much to hold the country together. ■

Netanyahu's new majority

# Wafer-thin

**Binyamin Netanyahu finally assembles another coalition**

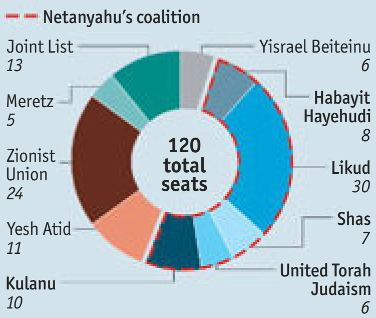
SEVEN weeks after winning an hard-fought victory in Israel's election, and just hours before a constitutional deadline, Binyamin Netanyahu informed President Reuven Rivlin on May 6th that he had succeeded—just—in forming a new government. It is hardly the coalition of his dreams. He had been negotiating with the right-wing and religious parties to build a solid block of 67 seats in the 120-member Knesset. At the same time he put out feelers to the opposition Labour Party leader, Yitzhak Herzog, to create a broader national-unity government with 70 seats or more. In the event, he has ended up with the slimmest of possible majorities: 61 seats.

On May 4th, Avigdor Lieberman threw a spanner in the works. He announced that, despite reaching a deal that would have allowed him to stay on as foreign minister, his party, Yisrael Beiteinu (Israel is Our Home), would not be joining the coalition. Bizarrely, he claimed that the new government, which will be one of the most right-wing in Israel's history, is "not national" enough because it was not formally

**Fragile formation**

Israel's Knesset election results, 2015

*(61 seats required to form government)*




Source: Haaretz.com

**Online:** The complete, complex history of Israeli politics in one graphic **Economist.com/knesset2015**

committed to building more houses in the Jewish settlements in East Jerusalem and the West Bank.

Mr Lieberman's accusation is surely disingenuous. The Settlement Division, a quasi-governmental agency that carries out most of the building in the lands occupied in 1967, will be controlled by a hardline settler, the intended Agriculture Minister, Uri Ariel. Mr Netanyahu's is hardly the government to rein him in. It is more likely that Mr Lieberman's decision to sit in opposition is a reflection of his deteriorating relationship with the prime minister, once a close ally, and his own waning influence following a measly election showing.

Without Yisrael Beiteinu, the coalition now has a bare majority of one. In the final 48 hours of negotiations, Naftali Bennett, the leader of Habayit Hayehudi (Jewish Home), the last party to sign an agreement, held the fate of the new Netanyahu government in his hands. Mr Netanyahu was forced to surrender the Justice Ministry, which is now set to be headed by Mr Bennett's ally, Ayelet Shaked.

A fierce critic of the Supreme Court's powers to strike down legislation, Ms Shaked will spearhead the right wing's campaign to diminish the court's role. But any such reform will be a struggle, thanks to the coalition's thin majority and disagreements between the five parties comprising it. The second-largest party in the new government, Kulanu, opposes the judicial change. But its leader, Moshe Kahlon, is expected to become finance minister, and wants to push through his own ambitious reforms of the banking and housing sectors. So he may be forced to concede on the Supreme Court.

It is hard to see how Mr Netanyahu's new government plans to counter an expected period of international pressure from America and European Union to restart the diplomatic process with the Palestinian Authority. For now, Mr Netanyahu is not even planning to appoint a new foreign minister, in the hope that Labour will join at a later stage and the job can go to Mr Herzog. Meanwhile, with a coalition resolutely opposed to freezing settlement-building or countenancing the establishment of a Palestinian state, any new peace initiative is a non-starter.

Mr Kahlon has been promised significant powers to reform the Israeli economy. But he has already been limited by exorbitant promises to the two ultra-Orthodox parties, Shas and United Torah Judaism, to restore benefits and roll back other policies designed to push members of their religious communities to join the workforce.

Five months ago Mr Netanyahu fired the ministers of the centrist Yesh Atid and Hatnuah parties, accusing them of trying to lead a "putsch" against him. He called an election even though his government had served barely a third of its term, saying "it cannot govern Israel." Next week his fourth government will be sworn in. With a tiny majority, and riven with rivalries, few are under any illusion that it will prove more durable than his previous one. ■

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Ebola in west Africa

# After the plague

NAIROBI

**Wonderful news from Liberia**

FOREIGN tourists have yet to return to the west African coast following last year's Ebola epidemic that infected 25,000 people and killed more than 40% of them. But should visitors come, little would strike them as out of the ordinary. Charnel houses once again function as hospitals. Some practices have changed: hygiene is a greater concern when handling the dead. But other habits such as shaking hands—avoided last year to prevent transmission—are again as common as ever.

Liberia is doing so well that the government and foreign aid agencies expect to declare it virus-free on May 9th, 42 days after the last victim will have been buried. On April 30th the American army closed a treatment facility for medical workers in the capital, Monrovia, that it opened in a hurry last November. It received only 42 people, but it stiffened the resolve of doctors and nurses by assuring them of excellent care, should they have become infected.

The other two countries walloped by the epidemic are recovering more slowly. Sierra Leone's schools reopened in mid-April and new Ebola cases are down to a trickle. But complete eradication is proving tricky; unsanitary conditions in slums aid transmission. A recent infection in the Moa Wharf township of Freetown, the capital, led police to put it into quarantine; when seven of its residents fled, they were chased across the city. Amnesty International, the human-rights lobby, says the government is abusing emergency laws. Officials retort that "strong hands" are needed to beat the virus.

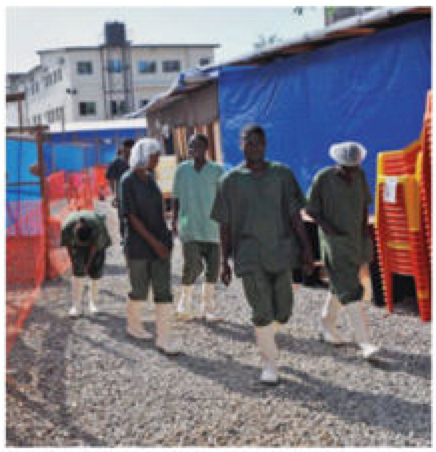
Guinea, where the outbreak began in December 2013, is now the worst-affected of the three, with a dozen or more new cases a week. The town of Forecariah close to Sierra Leone has the highest incidence. Cross-border transmission is the main threat to countries where the virus has died out.

Another concern is infection through unprotected sex with male survivors. The virus has been found in their semen long after they tested negative. In a recent case a 46-year-old man infected a lover almost 200 days after he first showed symptoms, far later than previously thought possible.

Overall, though, the fight against the virus is being won. Perhaps too fast. Pharmaceutical researchers have been racing to develop a vaccine but need patients to test it. While they welcome the decline in cases, a complete victory would undermine work aimed at fighting the next outbreak.

Ebola may be almost beaten, but it has taken a heavy toll on public-health services in west Africa. Some doctors and nurses died, and others fled. Confidence in those remaining is weak. Attendance at clinics in Sierra Leone plummeted by 70%, according to Médecins du Monde, a charity. Mortality rates from diseases other than Ebola have shot up. Liberia's president, Ellen Johnson Sirleaf, says her country's already feeble medical sector has collapsed.

Do-gooders in America and elsewhere promise to sustain aid after the epidemic fades. Barack Obama held a presidential summit with west African leaders at the White House last month. On May 4th Bill Clinton attended a Liberian conference on "long-term recovery". Bill Gates has pledged $75m for a global disease surveillance network. But locals fear the West's attention span may be too short. ■



**But more to do in Guinea**

Kenya and its Somalis

# Scapegoats

DADAAB

**Closing a huge Somali refugee camp in Kenya would not reduce terrorism**

BEFORE the refugees came, Dadaab was a forgettable little way-station in north-eastern Kenya on a dusty road to Somalia. More than two decades later the original town is dwarfed by five sprawling camps spread across flat, dry land that together house at least 350,000 people. It is Kenya's fourth-largest population centre and the world's biggest refugee settlement. As Kenya's government struggles to deal with Islamist terrorism, it is blaming Somali refugees and wants Dadaab gone.

The Shabab, a group that is linked to al-Qaeda, are based in Somalia but operate with growing frequency in Kenya. They boasted that they had perpetrated a massacre in early April, when four gunmen killed 148 people, mostly students, at a university in Garissa, a town 80 km (50 miles) south-west of Dadaab. The Shabab also carried out an attack in 2013 on the Westgate shopping mall in Nairobi, Kenya's capital, killing at least 67 people.

Kenya's response to the latest attack was to threaten to close the camp and to outlaw 85 remittance companies, civil-society groups and businesses, all accused of funding terrorism. "The refugee camps are full of Shabab," says Albert Kimathi, a local official in Dadaab town. "This is the breeding ground for what goes on in Garissa, Nairobi and Mombasa," he says, citing Kenya's port, where Muslim dissent has grown.

After Westgate, Kenya's government proclaimed a "voluntary repatriation" scheme that took over a year to get going and was largely ignored; barely 2,000 Somalis have taken up the offer to return. In the wake of the horror in Garissa, William Ruto, Kenya's deputy president, said the UN refugee agency that oversees Dadaab should close the camp within 90 days; otherwise, he promised darkly, "we shall relocate them ourselves."

In Dadaab the refugees expressed panic and defiance. Many have lived there for a quarter of a century and are afraid to go back to their country, which is still rent by violence. "Let them come!" says Kadijo Ali, a slim, feisty woman who came to Dadaab as a baby and now has her own six-month-old daughter strapped to her back. "I'm not going anywhere, even if they kill me." Residents deny that the camps are riddled with jihadists. "There are no Shabab here," says Mohamed Yusuf, a 44-year-old teacher and clan elder. "I've lived in Dadaab for 25 years and have never seen a training ground or met a Shabab. If they came, we would report them to the police."

In any case, Kenya's government could not afford to move so vast a throng of people. Nor would it enjoy the opprobrium if it defied international law by evicting refugees. Kenya's foreign minister, Amina Mohamed, herself an ethnic Somali, admitted as much when she set up a "tripartite commission" with representatives of Kenya, Somalia and the UN refugee agency to plan Dadaab's future. When John Kerry, the American secretary of state, visited Kenya on May 4th he acknowledged that hosting so many refugees for so long was "an enormous challenge". He promised the UN refugee agency $45m towards its Kenya operations, adding that he was "confident that Dadaab will remain open". Two days later Kenya's president, Uhuru Kenyatta, softened the government's stance, saying that Kenya "has been, and will continue, fulfilling its international obligations."

The evidence suggests instead that terrorism in Kenya is increasingly home-grown. All four Garissa gunmen were probably Kenyan. Others arrested and tried for Shabab attacks in Kenya in the past have been Kenyan, too. Some were converts to Islam. Not one was a refugee. ■

South African wine

# Chin-chin in China

FRANSCHHOEK

**South Africa's winemakers are eyeing a new market**

"I'M big in China," says Hein Koegelenberg, a wine magnate with a rugby player's build and a broad grin. He heads two well-known South African estates, La Motte and Leopard's Leap. Along with his lesser-known Chinese joint venture, Perfect Wines of South Africa, he accounted for a good half of South Africa's total wine exports to China in 2013, or 3m of 5.8m bottles. Overall, South Africa's wine sales to China grew by 63% in 2014. Whereas the South Africans are still small fry compared with French winemakers or even with Australians, they are determined to find a way into the hearts of Chinese drinkers, spurred on by fluctuating sales in their traditional markets in Europe.

Mr Koegelenberg, for example, took the advice of his Chinese partner, who told him to make the labels look French. So in 2011 "L'Huguenot" was born, a South African brand for China only. The name is a tribute to the early French Protestant immigrants to South Africa, with traditional-looking labels featuring a vineyard sketch. But look closer and you see a Cape Dutch farmhouse, set in South Africa's distinctive landscape. The grape varieties are typically South African (a Chenin Blanc; a Shiraz-Pinotage blend) and chosen to complement the seafood of southern China and the spicy food of the centre-west.

Pieter Terblanche, the marketing manager at Swartland Winery, has a different approach. "Critter brands," he says, meaning you should find any excuse to put an animal on the label. "They quite like the lions." Swartland Winery, bought last year by William Wu, a Chinese immigrant to South Africa, is newer to the Chinese market. "He's seen growth in Asia and wants to secure the supply chain," says Mr Terblanche. The winery made its first shipment to China last year, ahead of January sales for the Chinese New Year holiday.

Mr Koegelenberg has had to keep up with China's changing tastes: for example, sales of expensive wines for "gifting" to business partners have fallen off under the edicts of President Xi Jinping. There has been a learning curve for all involved. Every year Mr Koegelenberg brings 250 sales representatives from across China to the Cape winelands for a week. They learn about South Africa and how to taste wine, and visit the vineyards to see the picking, sorting and pressing of grapes. Mareli Roux, a public-relations manager, tells how the programme had to be adjusted. "They take a million pictures. We added time into the schedule for pictures."

The Economist

SPECIAL REPORT
INTERNATIONAL BANKING
MAY 9th 2015

# Slings and arrows


THEY SAY
change is the only constant
WE MAKE
value a constant, too
The big challenge for any enterprise isn't only setting a vision for change, but implementing it effectively. At KPMG, we not only help you envision a plan for the future, we work with you, shoulder to shoulder, to turn it into action that delivers real value. To learn how KPMG can transform vision into value for your business, visit kpmg.com/transformation.
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# Slings and arrows

**Financial technology will make banks more vulnerable and less profitable. But it is unlikely to kill them off, argues Stanley Pignal**

FROM THE WAY Silicon Valley talks about banking, you might well conclude that the industry was ripe for oblivion. The T-shirt-wearing whizz-kids and their backers reckon that newcomers will do to JPMorgan Chase, HSBC and the rest what e-mail has done to post offices and Amazon to bookshops. So far bankers have simply failed to notice that their sprawling firms will become tomorrow's low-margin utilities. Finance, all bits and bytes, is at heart a tech problem, the Valley believes, and will be solved by tech companies, not the lumbering banking gerontocrats.

This is not just intemperate youth speaking. Strikingly, many more entrepreneurs and investors now believe that it is possible to take on the banks. In San Francisco, London, New York and elsewhere, venture capital is pouring into financial technology, or "fintech", making it arguably the hottest spot in a bubbly funding environment for startups. Last year firms in this sector attracted $12 billion of investment, up from $4 billion the year before, according to CB Insights, a research firm. A handful of fintech insurgents have already graduated from startups to listed companies, achieving billion-dollar valuations. Plenty of others seem to be heading the same way.

The momentum is such that all of banking's many metiers seem up for grabs. Fancy a loan? Forget your local bank branch and head to Lending Club, a peer-to-peer platform which matches people who need money with those who have some to spare. Want to send cash overseas? Eschew your bank's rip-off foreign-exchange charges in favour of a startup that specialises in international money transfers. And why have a Porsche-driving wealth manager handling your retirement pot when an algorithm can replicate his advice for a small fraction of the cost? From payments to insurance to business lending, one newcomer or another has its eye on almost everything that financial-services firms offer. AngelList, a website that tracks startups, lists around 4,000 of them in fintech.

This wave of innovation is all the more noteworthy because finan- ▸▸

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A list of sources is at **Economist.com/specialreports**

An audio interview with the author is at **Economist.com/audiovideo/specialreports**

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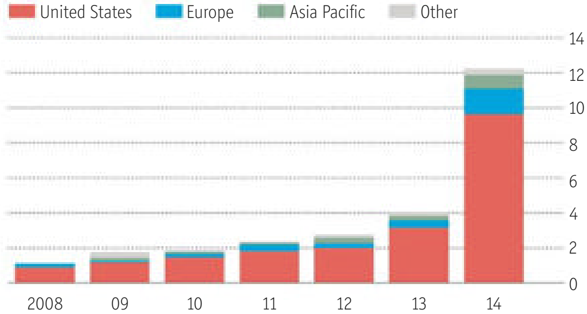
The shape of things to come

Global investment in fintech, $bn




Source: CB Insights

cial services used to sit above the Silicon Valley fray: an industry so regulated and so politically connected that tiddlers trying to take it on stood little chance. The startup ethos of "move fast and break things", whereby repeated failures are accepted as staging posts to success, seemed incompatible with banking's conservative culture in which a single crash could send the global financial system into convulsions. Regulators, once considered too lax about allowing innovation in finance (synthetic collateralised-debt obligations and other pre-2008 inventions will not soon be forgotten), were expected to deal cautiously with this new burst of financial creativity. Yet so far they have let fintech flourish, and thereby done more good than harm.

All told, financial-services firms in fields that fintech could potentially disrupt generate global revenues estimated at $4.7 trillion a year and profits of $470 billion, according to analysts at Goldman Sachs, a bank. Incumbents once believed that finance was immune from such disruption, but now they are less sure. "Bankers used to think regulation would make financial services less appealing for new entrants. Now the penny is dropping that non-bank rivals can just attack more profitable areas and skim the cream," says Huw van Steenis at Morgan Stanley.

A slide that has been making the rounds in Silicon Valley shows the new competitive landscape for Wells Fargo, a bank based in nearby San Francisco. These days its rivals are not Bank of America or some Chinese newcomer that offers the same wide array of services. Instead, dozens of startups are each trying to lay claim to a small sliver of the business: saving for college, say, or payroll services for companies.

Few want to take on the central, regulated core of taking deposits. Each may offer a superior or cheaper service in its specialist field. Most of these startups will fail, and even successful ones will be little more than pinpricks for a banking mastodon with trillions in assets. Yet in combination they may amount to something more substantial.

"Silicon Valley is coming," warned Jamie Dimon, JPMorgan Chase's boss, in a recent letter to shareholders. "There are hundreds of startups with a lot of brains and money working on various alternatives to traditional banking." Banks' cost bases—IT systems, smart headquarters, staff, branches and so on—require income from a wide range of services. If even some of those services get "unbundled", in the parlance of fintechers, the economic models that have sustained banks for decades will be under threat. So the incumbents pay lip-service to the newcomers, and some even have in-house teams scouting for innovators to stop them from eating their lunch.

Several factors have made the banks more vulnerable. New technologies such as smartphones and cheap data processing have lowered barriers to entry. However, "technology is necessary but not sufficient" to change attitudes towards finance, says Mike Cagney of SoFi, a peer-to-peer lender based in San Francisco. The financial crisis has left consumers more open to trying alternatives to the banks they had to bail out. Fintech newcomers are tapping into a deep reservoir of consumer mistrust towards incumbents. And as with tech generally, the sector is attracting a lot of bright graduates who would rather not be working on Wall Street or in the City of London.

The coming-of-financial-age of the "millennial" generation, which is both large and perennially glued to its iPhones, certainly plays a part. This cohort of 18- to 34-year-olds has grown up with the internet and turns to it to find anything from a taxi to world news, turning many established industries upside down. They seem willing to trust web-based newcomers with their financial affairs, too. Few millennials visit bank branches. A third of them do not think they will need a bank account at all before the end of this decade. One survey found that 71% of them would rather go to the dentist than call on their bank. And in so far as they care about financial innovation at all, they expect it to come from tech groups, not today's incumbents.

At the same time the financial crisis has led to a bout of introspection at banks. Some of them have been overwhelmed by successive waves of new regulation requiring immediate management attention. Whatever IT budget they may have is likely to be spent largely on ensuring that ATMs go on spewing cash. Innovation of the sort that will pay off years after the current boss has decamped to his next job is not high on their list of priorities. Newcomers with no legacy systems and no pension deficits to worry about can do things more cheaply.

### Don't rest on your laurels

As a rule of thumb, banks make money in three ways, in roughly equal parts. All of these are now under attack. The first is the difference between the rates they charge borrowers and the interest they offer savers, known as the net interest margin. This requires skill in identifying creditworthy customers, which fintech outfits reckon they can do better than banks. "Think about the scenario of a loan officer talking to a prospective client. To software people, that looks like voodoo," said Marc Andreessen, a tech billionaire whose venture-capital fund has made large bets on fintech, at a conference last year. "The idea that you can sit across the table from somebody and get a read on their character is just nonsense." The approach of fintech peer-to-peer lenders is based on using data more adroitly than banks do. But their methods have yet to pass the test of a serious downturn in the financial sector or the wider economy.

The second way of earning money is by charging for making payments, for example through credit-card fees. Established giants such as Google or Amazon would once have been wary of tarnishing their brands by having anything to do with payments systems, but now all kinds of contestants are getting interested. Apple Pay, launched in America last year, allows people to pay in shops with a mere tap of a phone or watch, gatecrashing a payments ecosystem that used to be the prerogative of the banks. PayPal and others are offering buyers the option of settling in instalments, thus extending credit to customers who might once have looked to their banks for funds.

The third source of profits for banks is a cornucopia of fees, from charging for overdrafts to brokering investments. These look unlikely to survive intact. Human investment professionals are now being challenged by "robo-advisers" doing much the same job for a tiny fraction of the price. Outrageously unfavourable exchange rates imposed by banks when sending money abroad, once unavoidable, can now be circumvented via dozens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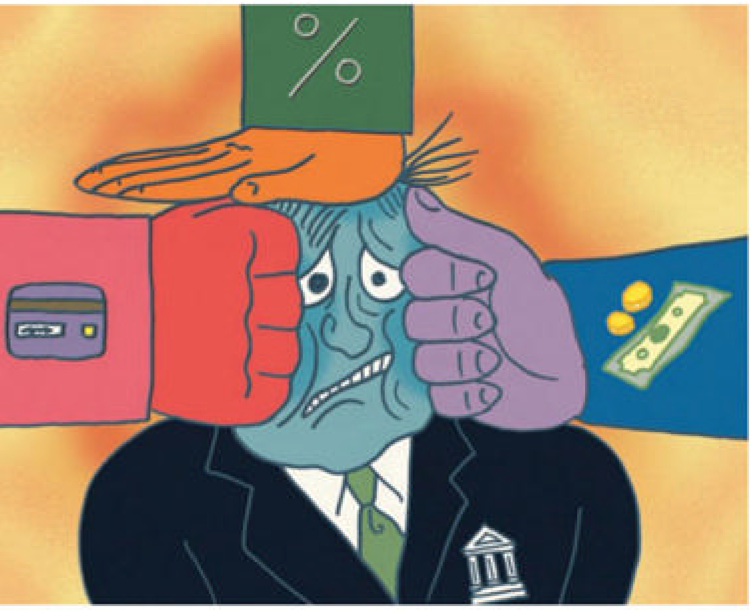
No matter which service fintech newcomers "unbundle" from incumbents, the banks' business model will suffer. For the moment, fintech's leading companies are still doing mere billions in trade where banks handle trillions. To fintech's detractors, that shows the newcomers have not got very far, despite all the hullabaloo. To its fans, it demonstrates that many years of exponential growth lie ahead.

This report will concentrate on new ventures with a consumer or commercial angle, leaving aside the well-established business of providing IT services to banks. It will focus mainly on what is happening in rich countries, though it will also touch on emerging markets, where technology is providing financial services to billions for the first time. Even so, the spectrum covered will be wide. Some parts, such as peer-to-peer lending, are not all that innovative (the technology has been used by eBay, an auction site, for nearly two decades), but are growing rapidly. There is more genuine innovation in the world of payments, which is likely to have the biggest impact on consumers.

At the extreme end of the spectrum are advances in technology that have yet to find a mainstream application, but soon might. Bitcoin, a digital currency made possible by clever cryptography, has lost its lustre as its price has tumbled from over $1,100 in late 2013 to $225 now. Many have dismissed it as a medium of exchange fit only for anonymity-seeking drug dealers and tax evaders. But enthusiasts imagine something like this will recast the entire financial system. They are bowled over by the technology that underpins the currency, a decentralised, immutable ledger called a "blockchain" that allows people to transact business without the intermediation of a trusted third party.

Banks, which often play just such a third-party role, are watching all these developments closely. They used to dismiss fintech as an amateurish attempt to take on a venerable industry, with no hope of disrupting it, but have stopped scoffing. Enough billion-dollar firms have been created to tempt entrepreneurs. No doubt plenty of venture capital will be squandered on dud fintech companies. But if even a handful of them thrive and take on the banks, it could make a difference. And nowhere is that happening as fast as in the activity at the very core of banks' business: lending. ■



Peer-to-peer lending

# From the people, for the people

### But will financial democracy work in a downturn?

SAVERS DO NOT get much in the way of interest from their banks these days. But a different logic seems to apply to borrowers, who still often pay double-digit rates for credit—if they can get it at all. That has attracted a number of outfits offering to connect those who need cash with those who have a surplus of it. The rapid growth of such "peer-to-peer" lenders has been one of fintech's most visible successes. The biggest such firm, Lending Club, based in San Francisco, listed its shares in December to a clamour reminiscent of the 1999 tech boom.

Fans compare peer-to-peer lenders to other pioneers of the "sharing economy". Like Uber with cars and Airbnb with accommodation, the newcomers are making available a commodity they do not provide themselves: in this case, money. Instead of a bank intermediating between savers and borrowers, the two parties deal with each other directly. The platforms do the credit-scoring and make a profit from arrangement fees, not from the spread between lending and deposit rates.

The sector has grown rapidly: the five biggest platforms for consumer lending—Lending Club, Prosper and SoFi, all based in San Francisco, and Zopa and RateSetter in London—have so far issued nearly 1m loans between them and are generating more at the rate of well over $10 billion a year. The Anglo-Saxon countries are the spiritual home of credit, and so of peer-to-peer lending, but smaller platforms exist in mainland Europe and China.

Those loans are still dwarfed by the $3 trillion of consumer debt outstanding in America alone. But the sector is doubling its lending roughly every nine months, and almost everyone expects it to go on growing rapidly. Having started as a provider of unsecured consumer credit, competing mainly against banks' credit cards, it has expanded into lending to small businesses, student loans and now mortgages.

Though most of the lenders were established before the financial crisis, none thrived until its aftermath. This was partly because the banks' rapid retrenchment after 2008 created unmet demand for loans. In America, even those who could still borrow from conventional sources soon found that peer-to-peer providers offered better deals. Credit-card rates tend to remain stable through the economic cycle, so they have looked especially uncompetitive as central banks pushed interest rates to record lows. Lots of borrowers paying 18% on their credit-card balance found they could take out a peer-to-peer loan charging 14% instead. On the other side of the equation, low interest rates meant savers were open to new investment opportunities, including lending their money to perfect strangers on the internet.

### Knowledge is power

More broadly, says Hans Morris, a venture capitalist who sits on Lending Club's board, the declining cost of information-gathering is pushing consumer credit the way corporate credit has gone over the past three decades. In 1980 only a few hundred blue-chip firms could borrow from investors other than banks, by issuing bonds. By the end of that decade, all creditworthy firms could do so, and by 2000 "junk"-rated firms were at it, too. But whereas the incumbents, through their investment-banking arms, played a key part in the lucrative business of helping firms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issue bonds, they have no role in peer-to-peer lending.

Those pining for the democratisation of finance have been disappointed by one notable development: most of the money for peer-to-peer no longer comes from the general public but from institutional investors such as hedge funds. The industry makes no secret of this; in America many firms have dropped the peer-to-peer label and instead describe themselves as "marketplace lenders". The shift has increased the supply of money to borrowers, but also made it harder for the newcomers to present themselves as markedly different from the banks.

Yet from a regulatory point of view, they are indeed very different. There is much to like about peer-to-peer, no matter whether the money is being put up by a hedge fund or by the general public. A bank is fragile by nature: when it faces a slew of defaults on its loans, it rapidly runs into trouble. That is because it cannot pass on losses to its main creditors, often the bank customers who deposited their money on the firm understanding that they would get it back. Even when capital cushions designed to absorb lending losses are bolstered after crises, as happened after 2008, the risk of a taxpayer-funded bail-out or some other state support is ever present.

By contrast, those who lend money through peer-to-peer platforms explicitly accept that they may suffer losses. Unlike bank deposits, their investments are not guaranteed by the state. And whereas banks are subject to runs when too many fickle depositors demand their cash, lenders on peer-to-peer platforms know they will get their money back only when borrowers repay their loans.

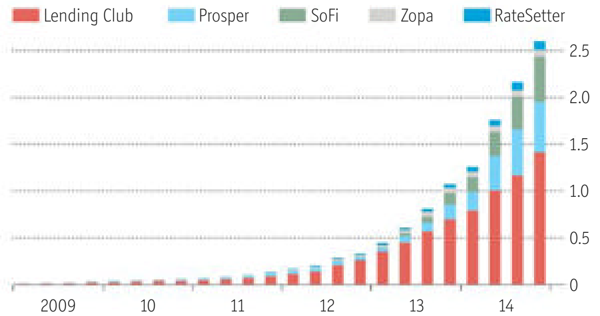
### A core task

Not all peer-to-peer lenders work the same way. Some platforms allow potential lenders to pick their borrowers, others oblige them to lend to all those approved for credit. British platforms typically feature protection funds, designed to compensate lenders exposed to loans that have defaulted. This twist makes them far more akin to banks. For all their differences, the peer-to-peer platforms perform one of the core tasks of the banking system: they pick the applicants who get credit, and at what interest rate. Many claim to be doing a better job than traditional lenders.

A common refrain is that banks are on the defensive, trying to keep risk-averse regulators happy. The peer-to-peer crowd do not have to contend with that, giving them scope to try new things. All of them start their assessment of potential borrowers by looking at a raft of readily available consumer data from credit bureaus such as FICO and Experian, which track who has welched on past bills or car payments (banks use these too). They overlay that with whatever information they can get their hands on, from employment history to verifying pay cheques directly with employers. Borrowers may be asked to provide their online banking details so their financial history can be downloaded from their bank's website. That means the incumbents no longer have much of an information advantage over anyone else.

**A lender be**

New loans issued, $bn




Source: Goldman Sachs; company reports

Any data can be mined for insights, says Martin Kissinger of Lendable, a British newcomer: how often someone has used a credit card to withdraw cash, say, or whether he makes minimum monthly repayments. Zopa tracks the applicants it has turned down for loans to see if they turned out to be good credit risks when they found another willing lender. "We don't necessarily have better data, but we are far better at analysing what we have," says Giles Andrews, its boss. Social-media activity was once touted as the new frontier for credit-scoring, but is no longer considered so useful except, crucially, to help prove an applicant's identity. In America, rules intended to ensure that credit is allocated fairly—by protecting minorities whose neighbourhoods used to be "red-lined" by bankers—make it harder to use novel techniques.

Kreditech, a German startup which makes short-term loans in countries from Peru to Poland, says it uses 20,000 data points to extend high-interest credit at a rate of $120m a year. Beyond using Facebook data, it says it can "triangulate the truth" about a customer's creditworthiness by using behavioural data such as the way its online application form is filled in. How often a customer uses capital letters, say, or the speed at which he moves his mouse during the process are useful clues. "We are a tech company that happens to be doing lending," says Lennart Boerner, its head of strategy. If Silicon Valley dismisses the idea that bankers can gauge their customers' creditworthiness by meeting them face to face, bankers may consider fintech's method as sorcery.

Some credit-scoring is more intuitive. SoFi has carved out a niche pitching credit to what the industry calls HENRYS: high income, not rich yet. It built a franchise refinancing student loans for asset-poor but high-potential graduates of top universities, whom it sees as good credit risks. Those loans run to around $75,000, against the $10,000-$15,000 more typical on other platforms. "Our credit assessment looks to the present and the future, not just the past," says Mike Cagney, its boss. That has a harsh flipside: those who default on their loan risk having their name broadcast to the lenders, "so the whole community knows

*Peer-to-peer lending would not have flourished without the benign credit conditions of recent years*

you're a deadbeat." It is the first established platform to branch out into mortgages, offering loans worth up to 90% of the value of a house—much more than a bank.

Many people will feel it is too soon to encourage innovation in underwriting, let alone higher loan-to-value ratios, given what happened in 2008. Sceptics argue, rightly, that divorcing the party which authorises credit from the party which will suffer from a default has proved disastrous in the past. Was the financial crisis not triggered by borrowers being given too much credit by mortgage-brokers who cared little if those loans were repaid? How are peer-to-peer platforms different, given that they immediately offload the loans they have approved?

The comparison is unfair, says Renaud Laplanche, Lending Club's founder. Before 2008 subprime mortgages had long, diffuse chains of intermediation. By the time a mortgage was brokered, sold, sliced, diced, repackaged and resold into the market, few cared or even remembered who had issued it. With peer-to-peer, the chain is much shorter. "If loans we issue do not perform, we have nobody else to point the finger to," says Mr Laplanche. A platform that issues dud loans will struggle to attract bidders, be they hedge funds or the general public.

The bigger question is what happens when economic conditions turn. Peer-to-peer lending, though enabled by technology, would not have flourished without the benign credit conditions of recent years. For all the talk of superior underwriting, the industry's claims of beating banks at their own game will be tested only when interest rates rise or the economy tanks. The industry is aware of this. "My daughter could come up with an underwriting model based on what band you like and it would work fine right now," says SoFi's Mr Cagney. But for how long?

At best, peer-to-peer lenders may find their advantage over banks becomes eroded. As interest rates rise, credit cards will probably become more competitive (though they may be pricier for less creditworthy borrowers). Peer-to-peer marketplaces will probably have to raise their own rates to attract investors lured by improved returns elsewhere. So the opportunity to arbitrate credit mispriced by banks may narrow, particularly in America.

At worst, a credit shock or a recession will leave existing borrowers unable to repay their loans. One worrying feature as the industry matures is that many borrowers are return customers: they are using peer-to-peer loans to refinance peer-to-peer loans taken out earlier. That is particularly true for riskier borrowers. If the industry were to contract even slightly, those unable to refinance would be pushed to default. If banks were to tighten lending criteria at the same time, the customers' problems would multiply.

That might cause a downward spiral as withdrawals creep up: even a modest rise in dud loans might spook lenders, particularly flighty hedge funds. In the absence of fresh money to repay old loans, more defaults would be inevitable, followed by more exits by investors. That is one reason why most peer-to-peer lenders are eager to keep some of their loans funded by retail money. Mom-and-pop investors are thought to be "stickier" in a downturn, so their money will remain available for future loans.

All platforms vaunt their superior underwriting skills and boast of having "prime" borrowers, but they are also under pressure to show rapid growth in their loans. The temptation—which all claim to be resisting—is to relax their rules and pitch loans to those at the shadier end of the credit spectrum. This may be encouraged by apparently low default rates, but these are flattered by the rapid growth in lending: a 10% default rate will become 5% if a loan book has doubled in the meantime.

On the other hand, if peer-to-peer can weather the next downturn it should get a fillip. Big-money institutions such as insurance companies and pension funds have so far only dipped their toe into the sector. Many of them need better returns, and have long-term liabilities they are keen to match with long-term assets such as mortgages. If unsecured consumer loans perform as well in a downturn as their boosters hope, some investment titans will be tempted to buy paper from peer-to-peer platforms directly, dwarfing the hedge funds that are already there. A few might buy pools of mortgages from peer-to-peer lenders instead of tapping Wall Street for complex securities whose performance tracks the performance of those same pools of mortgages.

A more surprising investor in this field is the banking sector itself. Small local lenders in America have turned to peer-to-peer marketplaces to gain exposure to consumer credit; Citigroup said in April that it would lend $150m through Lending Club. This might bemuse observers: why would a bank buy a loan rather than issue it itself? Mr Laplanche points out that although banks' cost of capital is lower, its cost of operation is higher. A bank spends roughly 7% of the value of a loan on administration, against Lending Club's figure of just 2.7%. Still, some might question the business model of a bank that admits it cannot successfully underwrite loans itself.

### A piece of the action

Peer-to-peer is the most established of all fintech's branches. Lending Club is listed on the New York Stock Exchange, and has John Mack, a former Morgan Stanley boss, and Larry Summers, a former Treasury secretary, on its board. Goldman Sachs estimates that when peer-to-peer comes of age, it could reduce profits at America's banks by $11 billion, or 7%. That would be troublesome but not unmanageable. Bankers point out that, leaving aside credit cards, unsecured loans to consumers are a fiddly business that is not particularly close to their hearts. The risk, though, is that a graduate who turns to a marketplace for her first loan then also shops there for services banks do care about, such as mortgages or investment advice.

Peer-to-peer lenders have their own problems, even when the economy is steaming ahead. Acquiring customers, which is often done through mailshots, is expensive and erodes margins. Overheads are rising steadily. But regulators have kept reasonably clear so far because the risks around this form of lending are borne by those who put in the money, not by the general public. As long as that remains the case, the challenge they present to banks should be heartily welcomed. ■

Crowdfunding

# Cool, man

### Where small businesses can borrow if the banks turn them down

BANKERS ARE CONSERVATIVE types. It is hard to imagine any of them jumping at the opportunity presented by Ryan Grepper, an Oregon-based "part visionary, part mad scientist, and a passionate supporter of the DIY revolution", to lend him $50,000 to develop an oversized picnic cooler. Not just any cooler, mind you, but The Coolest, which beyond keeping drinks chilled also blends them, blares music and recharges gadgets. But what bankers would surely have disdained, the public seized with gusto: last August Mr Grepper raised $13.3m from Kickstarter, a crowdfunding platform, over 250 times what he had asked for. None of the money he has received will ever need to be repaid, either. Instead, the first 63,380 coolers he makes will go to the backers who put up around $180 each, with luck in time for the summer picnic season. A few will be hand-delivered by Mr Grepper, who offered personally to man the party bar for anyone who pledged $2,000 to his venture.

Financing small businesses is rarely this colourful. A few consumer-friendly ventures like The Coolest aside, corporate minnows have been struggling to raise money in recent years. The buoyant bond markets that have allowed large companies to borrow at rock-bottom rates do not cater to their smaller cousins. Banks have cut back on lending to small businesses as regulation has made it less lucrative. And since the due diligence needed to extend a $20,000 business loan takes nearly as much time as that for a $2m one, they have tended to concentrate on the bigger fish. A range of fintech ventures have popped up to try to fill the gap.

Some are akin to the peer-to-peer platforms that have done so well in consumer lending. Funding Circle, a British startup that is also active in America, advertises itself as "the bond market for small companies". It has disbursed nearly £600m of loans in Britain, some of them financed by government agencies. But applying fintech's data-guzzling model for consumer lending to small firms is tricky. There is far less readily available information to help gauge a business's creditworthiness than there is for a person's, says Samir Desai, the startup's boss. What can be discovered, from tax records and regulatory filings, is often of poor quality or well out of date. Funding Circle's method includes a step that would be considered retrograde by fintech purists: a flesh-and-blood credit agent from the company speaks to every new borrower before a loan is disbursed. Its pitch to borrowers is as much about convenience—the application process is less onerous than that of a bank, and borrowers get the money faster—as about getting better rates.

Peer-to-peer lenders to businesses, unlike their equivalents who lend to private individuals, do not have an obvious entry point such as credit-card debt that can be refinanced more cheaply. That makes it harder to acquire new customers. Many borrowers turn to peer-to-peer only after their bank has rejected them. In America, OnDeck, a platform that listed last year, has had to bat away suggestions that it is over-reliant on loan brokers, which charge hefty fees to bring in businesses looking for quick cash. And processing the applications can be fiddly, too, particularly when loans are secured against the borrower's personal assets. On the other hand, usury laws that cap interest rates for consumer loans do not apply to business credit, so rates can be higher. OnDeck's average interest rate is reportedly over 50%.

#### Branching out

Lending Club, the industry's biggest firm in personal peer-to-peer credit, is edging into business loans. In February it started offering American businesses up to $300,000 to finance purchases made on Alibaba, a Chinese online marketplace. The money is not secured against the merchandise, but the fact that a business has verifiably just purchased widgets from a Chinese factory strongly suggests it will soon be earning some money from widget sales.

Kabbage, a rival based in Atlanta, specialises in lending to ▸▸

*Many borrowers turn to peer-to-peer only after their bank has rejected them*

businesses that do most of their selling on e-commerce sites. It thinks it can work out who is a good credit risk by looking at a vendor's eBay sales history (and the accompanying reviews) in a way a bank cannot, or cannot be bothered to.

New models are emerging. Last year Square, a company that enables small businesses and individuals to process credit-card payments, started offering cash advances to some of its customers. As it has ready access to several years' worth of a merchant's payments data, it can take an educated guess at the likely future cashflow. Better still, because it will process the payments from which its advance will be refunded, it can withhold the cash at source. For a $10,000 loan, say, Square will take a 13% cut of card sales until $11,300 is reimbursed. Elegantly, though all customers end up paying the same $1,300 of interest, the interest rate will depend on how long it takes each borrower to repay the loan. The faster he sells and the faster the loan is repaid, the higher the effective rate. Borrowers eager to maximise their sales do not seem to mind. The average repayment period is about ten months. PayPal, a payments giant which is currently being spun out of eBay, is now offering a similar service to its merchants.

### An invoice worth its weight in gold

Small businesses would love to be able to monetise what is often one of their biggest assets: the money customers owe them. Most of them have to wait for 30-90 days after they have dispatched the merchandise before getting paid. A slew of smaller (and sometimes not very savoury) finance houses have traditionally offered to buy the outstanding invoices at a discount, paying perhaps 60 cents on the dollar. Leaving aside the risk of fraud, the paperwork was daunting.

By moving invoices onto electronic platforms, fintechers hope they can make the process frictionless. A plethora of such platforms are competing to make e-invoicing the norm. If a local business sells a shipment of ball-bearings to Ford, say, and the carmaker agrees electronically it will make good on the invoice within six weeks, that makes the invoice nearly as valuable as a Ford bond. It might be worth 98 cents on the dollar, not 60. The verified invoice can then be auctioned on a platform, or packaged up into the sort of security investment bankers clamour for. By turning the invoice into a fungible security, the local business in effect piggybacks on Ford's credit rating, which is likely to be much better than its own. In practice, the process remains fiddly for now. Nor is this a business that banks will give up easily. They typically offer far better rates on business loans they can secure against invoices, if only because regulators treat such lending more leniently than unsecured credit.

None of these financing options are viable for businesses just getting off the ground. In Britain, those with a good story to tell (and preferably a photogenic founder) can turn to one of dozens of equity crowdfunding platforms to drum up some cash. Crowdfunded equity money usually involves handing a stake in the business to the new backers. Nesta, a charity, says the British public invested £84m in such ventures in 2014, up over 400% in a year—even though the Financial Conduct Authority has warned that investors taking small stakes in budding businesses are "very likely" to get wiped out (tax breaks may ease the blow).

In America, the time-tested method of a plucky entrepreneur maxing out his credit card is still a rite of passage. That may be about to change. Rules that currently restrict investing in start-ups to investors with a net worth of $1m or an annual income in excess of $200,000 will be scrapped later this month. From then on anyone will be able to try their luck at crowdfunding. That is good news for those who want to invest in Mr Grepper's next off-beat venture and get a piece of the action, not just a deeply chic picnic cooler. ■

Money management

# Ask the algorithm

### Human wealth advisers are going out of fashion

AS PROBLEMS GO, the suspicion that you are being overcharged by a private wealth manager is one of the better ones to have in life. But even millionaires who are regularly invited out to lunch by their banker tire of the 1-3% annual fee they have to cough up for his investment advice. Many mere submillionaires may well be paying similar rates for an asset-management professional to administer their pension pot, often without being aware of it. Could a computer not do an equally good job dishing out standardised guidance on how much they should invest respectively in shares, bonds and other assets?

A raft of "automated wealth managers" is now available, on the premise that algorithms can offer sound financial advice for a small fraction of the price of a real-life adviser (see table, next page). With names that suggest a mix of blue-blooded discretion and startup ebullience—Wealthfront, Betterment, Personal Capital, FutureAdvisor—they are growing at a rapid clip. Most are grudgingly starting to accept the tag of "robo-adviser".

The platforms work by asking customers a few questions about who they are and what they are saving for. Applying textbook techniques for building up a balanced portfolio—more stable bonds for someone about to retire, more volatile equities for a younger investor, and so on—the algorithm suggests a mix of assets to invest in. Nearly all plump for around a dozen index funds which cheaply track major bond or stock indices such as the S&P500. They keep clear of mutual funds, let alone individual company shares. Testing the various algorithms, your risk-averse, youngish correspondent was steered towards an apparently sensible blend of low-fee funds to help his meagre retirement pot grow.

This sort of insight used to be guarded jealously by financial advisers, but now you can get it from the robo-advisers without so much as providing an e-mail address. The hope is that all but the most penny-pinching savers will then go on to purchase the mix of funds through the service, at an annual cost starting at around 0.25% of the assets invested. (Investors also pay the fees of the funds they buy, which adds another 0.15-0.30%.) Automated services offering more human involvement typically charge

**Here comes the robo-crowd**

Automated wealth managers*

| | Year founded | Minimum investment, $ | Advisory fee†, % | Assets under management ($m) | Investors served |
|---|---|---|---|---|---|
| Wealthfront | 2007 | 5,000 | 0.25 | 2,000 | 17,400 |
| Betterment | 2008 | 0 | 0.15 | 1,400 | 65,000 |
| Personal Capital | 2009 | 100,000 | 0.89 | 1,000 | 2,500 |
| FutureAdvisor Premium | 2010 | 10,000 | 0.50 | 240 | 1,700 |
| Nutmeg | 2011 | 1,500 | 0.75 | *na* | *na* |

Sources: Goldman Sachs; company reports *February 2015 or latest †Based on investment of $100k

closer to 1% a year. Most have much lower minimum investment limits than their traditional rivals.

A major selling point for robo-advisers is that they promise they will not make any money from their customers other than through the annual fee. That is refreshing in an industry rife with potential conflicts of interest. Banks, for instance, often recommend that their clients invest in funds run by their asset-management subsidiaries. Most of the newcomers offer automatic rebalancing of portfolios, so an investor's exposure to stocks or bonds stays much the same even as prices fluctuate. Many tout their "tax-loss-harvesting" capabilities.

### Small fortunes

The transparent fee structure appeals to sceptical younger investors, says Adam Nash, Wealthfront's boss. Around 60% of its clients are under 35, many of them with starter fortunes from Silicon Valley, where the company is based. The average account size is a touch under $100,000, an amount that would be uneconomic for a Merrill Lynch or Morgan Stanley broker to handle.

Mr Nash, a veteran of Apple and LinkedIn rather than Wall Street, compares the current growth in robo-traders to the rise of Vanguard, which in the mid-1970s pioneered low-cost index funds as competition to pricey mutual funds. Charles Schwab sprung up at the same time to undercut large banks' high-margin brokerages. What those newcomers were to the baby-boomer generation when it first started thinking about saving for retirement, Wealthfront is to the tech-savvy millennials at the same stage in their lives, he says.

Regulation has, if anything, helped the robo-advisers get off the ground. They emphasise that client assets are held by third-party depositary banks, still perceived as safe by the public. If one of them were to go out of business, investors would not lose any money. All are overseen by the same watchdogs as the incumbent banks they are taking on.

The robo-advisers are doubling their assets under management every few months, but their combined assets still run to less than $20 billion, against $17 trillion for traditional managers. Several banks manage over $1 trillion each. The robo-newcomers are nowhere near big enough for sustained profitability, says Sean Park of Anthemis, an investment firm that has backed Betterment. "To be successful [a firm] needs to manage tens of billions; to be really successful they need to manage hundreds of billions." In the meantime, they are living off the largesse of venture capitalists, who poured nearly $300m into various robo-advisers last year.

If they are to be successful in the longer term, they will have to persuade today's 20-somethings to remain loyal to automated services when they become wealthier 40-somethings. Traditional investment advisers think they can win over older customers by offering them services such as inheritance planning. But just in case, the incumbents are working with the robo-insurgents.

Schroders, a large European asset manager, has backed Nutmeg, Britain's largest newcomer. Vanguard, the group that puts together the low-fee funds that most robo-advisers recommend, is launching its own low-cost advisory service. JPMorgan Chase and Goldman Sachs have backed Motif, a startup that builds baskets of stocks based on investment themes. Charles Schwab, now a wealth-management giant with $2.5 trillion under management, in March rolled out its own automated wealth service, targeting people with as little as $5,000 in savings. It charges no fees upfront but guides clients towards some of its own investment products—a breach of the unwritten robo-advisory code.

Schwab's arrival was discreetly celebrated as a validation of the automated advisory model. A truce of sorts seems to be in the offing. Betterment now offers a "white-label" version of its platform, so that human wealth advisers can pass off the computers' diligence as their own. Fidelity, a giant financial-services firm, is among those trialling the service. Human-based advisory services point out they have lots of clever computer wizards working for them. Robo-advisers, for their part, boast about the pioneering investment thinkers they employ, programming the computers to recommend the right products. ■

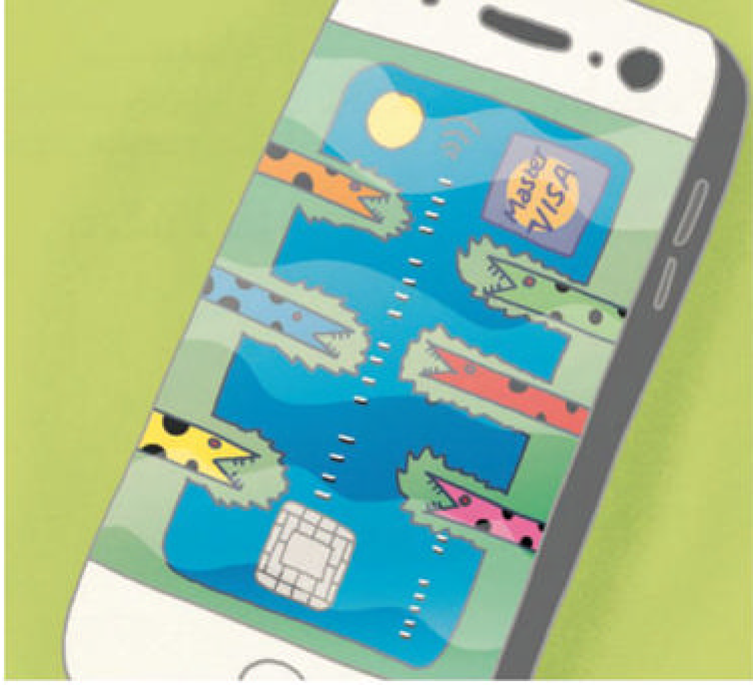
## Sweet and low

**Remittances abroad are attracting competition**

Newcomers have launched an assault on another market where banks used to hold sway: foreign exchange. By one estimate, consumers and small businesses make cross-border payments worth $5 trillion-10 trillion a year, and often complain about the banks' snail-like service and preposterous fees. In the $550-billion-a-year market for remittances by migrants, competitors such as Western Union (now itself under threat) have already given the banks a run for their money. But most people make international payments only rarely, and had to accept what the banks offered.

Recently dozens of hungry startups with lower costs have piled in. TransferWise, based in London, claims that its charges are up to 90% lower than the banks'. Customers pay £5 for converting £1,000 into euros, say, at the mid-market rate, whereas banks will typically have one rate for buyers and another for sellers, making a profit on the spread.

Like peer-to-peer lending and the Uber-style sharing economy more broadly, it works by matching buyers and sellers, tapping wholesale markets to plug gaps as needed. Technologically this is hardly ground-breaking, concedes its founder, Taavet Hinrikus: "Technology is an enabler of what we do, but a lot of the innovation is business-model innovation." Few who have used online moneychangers, including your correspondent, have ever gone back to their banks for foreign exchange. But what is good for the public may not make for great businesses: margins are likely to be thin.




Payments

# A penny here, a penny there

**If you have money—and even if you don't—you can now pay for your purchases in myriad ways**

FINANCE, THE ADAGE goes, is the art of passing money from hand to hand until it finally disappears. This will ring true to anyone who has tried to send cash overseas and found their remittance whittled away by commissions and lousy exchange rates. Shopkeepers typically pay around 3% on sales made by credit card. Banks are involved in over $400 trillion of transfers every year and extract over $1 trillion in revenues from them, according to the Boston Consulting Group. As consumers in both rich and poor countries eschew cash in favour of paying with plastic or, increasingly, online and on their mobiles, that figure could reach over $2 trillion by 2023. But the banks no longer have the field to themselves.

Few consumers give much thought to what happens after they present their credit card at their local coffee shop, unaware of a tangled web of ever-shifting alliances and rivalries below the surface. Banks dominate an ecosystem which includes technology providers and payments networks—mainly Visa and MasterCard, which were themselves owned by a consortium of banks until a few years ago. The payments chain can contain up to seven links, every one of which will claim a tiny cut of each transaction. Most of the money ultimately goes to banks. Beyond collecting commissions on purchases, they profit because card users often pay with money they do not have, running up credit-card debts or overdrafts on which the banks charge steep interest.

Any change to this system would seem to threaten an extremely lucrative business at the core of the modern banking system. In practice the effect is more mixed. If the newcomers are increasing the size of the overall payments pie, they are actually doing the incumbents a favour. On the other hand they may be cutting the banks' margins by forcing them to share the fees. And some may collect consumer data that banks want to hold on to.

One contestant might do all three of the above: Apple Pay, launched in October in America and expected to be rolled out globally this year. Paying with the tap of an iPhone or Apple Watch feels new to consumers, but it amounts to recreating a plastic card on a mobile phone. The tech giant is not trying to bypass the vital Visa and MasterCard "rails", in the industry's parlance—the heart of the system that banks know and profit from.

Less happily for the banks, Apple is taking a 0.15% cut of all payments made through its system. Banks fret that this "Apple tax" will rise once consumers have got used to paying with their iPhones, but hope that the increased use of their cards—probably at the expense of cash—will ultimately leave them no worse off. And in America they were lured by promises that Apple would neither capture nor use the data it acquired from purchases. However, that pledge might not apply in other markets.

### A walletful of data

Google and Samsung are already setting up rivals to Apple Pay. Bankers suspect that their main motive is to get hold of the data, which would give them even more detailed insight into their customers' lives. Any model that introduces an extra layer between consumers and their bank accounts—for example, by getting them to put money into an online "wallet" and spend it from there—makes the banks uncomfortable. If the wallets are filled in ways that bypass credit cards, the banks lose out both on fees and on access to consumer data.

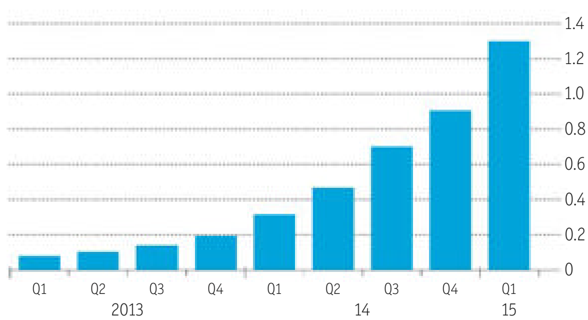
Facebook is another tech giant barging into fintech by letting its users in America message each other money. Peer-to-peer money transfer in that country has boomed in recent years. Venmo, ultimately part of PayPal, a purveyor of the sort of online wallets banks dread, is widely used by American youngsters for sending each other small amounts of cash. By turning money transfer into yet another mode of teenage interaction (users speak of "venmoing" a few dollars to each other), it has grown from transferring $59m a quarter in 2012 to about $1.3 billion now (see chart). Moving money through a bank can take several days and attract a $25 fee. Venmo's app is free and instantaneous. The company's tag, "it's like your phone and your wallet had a beautiful baby", does not even mention banks.

In other areas, innovation has if anything played into the banks' hands. Credit- and debit-card usage—and therefore banks' profits—have benefited from new technology that has made it possible for just about anyone to accept plastic. Square, founded in 2009 by a former Twitter boss, led the way in America with a nifty gadget plugged into any smartphone that enables food trucks, market sellers and other transient merchants to accept cards in the same way as any shop. Copycats are rolling out similar technology in Europe.

The next frontier is online payments, particularly the mobile sort. What used to be a nuisance—pecking in a 16-digit credit- ▸▸

**On the move**

Venmo mobile-payment volume, $bn




Source: Goldman Sachs

card number on a smartphone—is becoming ever more streamlined. Braintree (which acquired Venmo before itself being gobbled up by PayPal in 2013) and Stripe are among those doing for online merchants what Square did for food trucks: making it vastly easier for people to hand over money. Their pitch is that the less hassle consumers have to endure, the more likely they are to buy stuff online, justifying a small cut of the credit-card fee.

For merchants, payment systems that are easy to install on a website and help boost their all-important "conversion rate" from browser to buyer are worth shelling out for, says Scott Loftesness of Glenbrook, a payments consultancy. Apart from shopping on mobiles, users are already paying for plenty of real-world services online, too. Braintree processes money for Uber, the taxi app that is so convenient partly because customers do not have to hand over any cash: at the end of the journey a stored credit card is automatically debited.

Soon enough, consumers should be able to walk out of a clothes shop, say, and have their accounts automatically debited with their purchases (sensors, smartphones and cheap RFID tags on the labels will do all the work for them). That will not disrupt payments incumbents as such, but there is a risk that people will bypass credit cards in making these payments, thus cutting off the banks' lucrative commissions.

How payments evolve, and what role fintech will play in that, will depend largely on local circumstances. Every country has its own payments system, based on traditions and consumer preferences. Cheques are now a rare sight in Scandinavia, say, but they are still widespread in France, Canada and America (where, in a nod to innovation, banks encourage customers to cash them by taking pictures of them with their smartphones). In China, digital payments are ubiquitous and banks make much lower commissions.

Regulators can and do upend entire payments systems at will. Britain in 2008 forced banks to allow customers to transfer

## The bank in your pocket

### Mobile finance for the unbanked masses

AS MARKETING COUPS go, getting your logo onto more than 100m national-identity cards takes some beating. MasterCard is about to pull off this branding feat as Nigeria's electronic ID and payment card, currently being piloted, is introduced nationally. Providing financial services to customers who previously had no access to them is another side to fintech, often starting with payments.

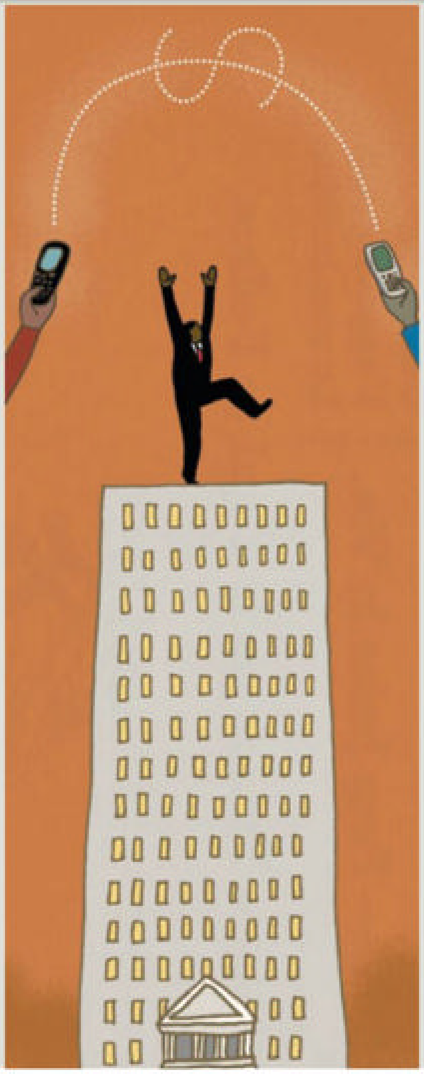
Globally, an estimated 2.5 billion people—over half the adult population—lack bank accounts. This financial exclusion leaves the poor relying on informal ways of saving (eg, cash under the mattress) or borrowing (eg, exorbitantly priced payday lenders). Development experts used to try to get banks to open branches in out-of-the-way places. Now they gush about bank-free finance, based on mobile payments or ID-based schemes of the sort Nigeria is bringing in.

In Africa, only one in four people has a bank account but eight in ten have access to a mobile. An early fintech success was M-Pesa, a Kenyan phone-based payments scheme launched in 2007 by Safaricom, a telecoms group. By knitting together a network of agents selling airtime into something akin to a banking grid, the scheme opened up cheap and instant payments to the masses. It is now used by three-quarters of Kenya's 22m adults. It has already spawned a savings-and-loans cousin, M-Shwari, which has signed up 9m customers and attracted deposits of 135 billion Kenyan shillings ($1.6 billion) in its first two years. It issues plenty of loans, too, which are far cheaper to administer and easier to scale than the micro-lending schemes once favoured by the development crowd.

In India, the Jan Dhan Yojana scheme launched last year by Narendra Modi, the prime minister, aims to provide each Indian household with a bank account by 2018. Most of them are with state-run incumbent lenders, but the government is issuing light-touch licences for "payments banks" designed to appeal to mobile-phone companies. For now, the new breed of financial institutions will not lend money and will take only small deposits. In South Africa, government-issued smartcards linked to accounts into which pensions can be paid have been taken up rapidly.

Such schemes used to be plagued by fraud, particularly in places with low literacy rates. Biometric identification makes it much easier and cheaper to verify people's identity, which is why MasterCard wanted to be involved in the Nigerian launch. A sturdy link between wallets and users' identity helps with integration into global remittances systems, which need to be able to track money to satisfy Western regulators.

As with M-Pesa, payment schemes often graduate to providing credit, leaving banks out of the loop. Poor countries are also becoming testing grounds for loans to consumers with patchy or non-existing credit histories. In most rich countries, credit bureaus provide lenders with plentiful information. In emerging markets, tech-driven firms such as Cignifi, an American group with operations in Mexico, Ghana and Brazil, try to generate credit scores based on things like records of mobile phone calls. Increasingly, poor-country consumers are being assessed for loans in the same way as their rich-world counterparts.



money instantly. The banks complained about the costs, but the change removed an opportunity for Venmo-like insurgents. American regulators are also planning to speed up bank payments, having already put pressure on the banks to reduce their credit- and debit-card fees. Come October, retailers in America will in effect stop processing fraud-prone cards with a magnetic strip (which are swiped at the till) and switch to safer ones with chips (which require a PIN number). That will require 16m terminals to be upgraded, says Osama Bedier of Poynt, a maker of snazzy payment terminals that is hoping to gatecrash the market.

All this adds up to a mix of opportunities and threats for banks. On one hand, startups like Square and Stripe are helping them find new merchants to use their cards, so generating more fees. On the other, those interlopers are getting a cut of the action—though not always enough to be sustainably profitable, critics suggest—and consumers may in time bypass the debit- and credit-card system that is so lucrative for banks. Millennials are already eschewing credit cards altogether.

Some payments groups are now starting to intrude on banks' traditional preserve of lending. Square is offering cash advances to merchants who use its payments systems; others are extending credit to buyers. PayPal Credit, once known as Bill Me Later, allows buyers to defer payments on purchases; Amazon now offers a similar instalment scheme to customers buying larger items. Klarna, a Swedish startup, and Affirm, an American one, offer merchants immediate payment even as customers are given several months' grace. Yet the gradual shift from cash to mobile and plastic payments still leaves the banks sitting reasonably comfortably, even if they resent impositions such as the 0.15% fee they have to stump up to get the Apple Pay business. The fintech insurgents work with banks as much as against them.

But what if someone were to come up with an entirely new way of transferring money that no one has thought of before? Many think that such a system is now within reach. ■

**Flash in the pan?**

Bitcoin


Source: Blockchain.info

Blockchain

# The next big thing

## Or is it?

ASKED TO NAME an event that has reshaped finance in recent years, bankers will point to the collapse of Lehman Brothers on September 15th 2008, the nadir of the financial crisis. Fintech types are more likely to mention something that happened six weeks later. On October 31st 2008 Satoshi Nakamoto, a pseudonymous cryptography buff whose real identity remains a mystery, unveiled a project he dubbed bitcoin, "a new electronic cash system that's fully peer-to-peer, with no trusted third party". It described what appeared to be a robust framework for a currency that could run without the backing of any government. Enthusiasts proclaimed that finance was about to enter the era of crypto-currencies. Since the need for a trusted third party has traditionally been a large part of the banks' *raison d'être*, this could mean that in future they will no longer be required—potentially a much more radical change than the other inroads fintech has made on their business.

Six-and-a-half years on, the bankers may feel they can relax a little. Interest in bitcoin has waned. After spiking at $1,100 in November 2013, its value has dropped to $225 (see chart). A few online retailers and trendy coffee bars accept it, but its yo-yoing value is one reason why its use in the legitimate economy is barely measurable (though it remains a favourite with drug-dealers). The general public has not forsaken cash or credit cards.

Interest in the underlying mechanics of the currency, however, has continued to grow. The technological breakthroughs that made bitcoin possible, using cryptography to organise a complex network, fascinate leading figures in Silicon Valley. Many of them believe parts of Mr Nakamoto's idea can be recycled for other uses. The "blockchain" technology that underpins bitcoin, a sort of peer-to-peer system of running a currency, is presented as a piece of innovation on a par with the introduction of limited liability for corporations, or private property rights, or the internet itself.

In essence, the blockchain is a giant ledger that keeps track of who owns how much bitcoin. The coins themselves are not physical objects, nor even digital files, but entries in the blockchain ledger: owning bitcoin is merely having a claim on a piece of information sitting on the blockchain.

The same could be said of how a bank keeps track of how much money is kept in each of its accounts. But there the similarities end. Unlike a bank's ledger, which is centralised and private, the blockchain is public and distributed widely. Anyone can download a copy of it. Identities are protected by clever cryptography; beyond that the system is entirely transparent.

As well as keeping track of who owns bitcoin today, the blockchain is a record of who has owned every bitcoin since its inception. Units of currency are transferred from one party to another as part of a new "block" of transactions added to the existing chain—hence the name. New blocks are tacked on to the blockchain every ten minutes or so, extending it by a few hundred lines (it is already over 8,000 times the length of the Bible).

The proposed transactions contained in new blocks do not have to be approved by some central arbiter, as in conventional banking. Rather, a large number of computers dedicate themselves to keeping the system running. Rewards are high enough for vast data centres across the world to want to participate. Known as "miners", they authenticate transactions by reaching a consensus on what the latest version of the blockchain should look like. In exchange, they are given newly minted bitcoin.

Chaining blocks together sequentially prevents anyone spending the same bitcoin twice, a bane of previous digital currencies. And the system is beyond tampering by any one party. Unlike a bank ledger, which can be altered by its owner (or a government), the blockchain cannot be changed without simultaneously overwriting all of the thousands of copies used by the miners at any one time. The definitive version of the blockchain

is whatever a majority of the participating computers accepts. None of them is connected to any centralised organisation. There is no bitcoin central bank to sway them. To overwhelm the system, someone would need to control 51% of the computing capacity of the 10,000 or so "miners"—not impossible but unlikely.

This system of consensus by distributed co-operation sounds complicated, but it allows something of value to be transferred from one person to another without a middleman to verify the transaction. Fans think this is a way of changing the centralised, institution-dominated shape of modern finance. It is genuinely new. The question is whether it is useful.

Proponents envisage an "internet of value" that can make money flow as freely as data are flowing already. Ridding the world of credit-card fees and foreign-exchange charges would be merely the first step of a much broader revolution. In the same way that e-mail did much more than replace letters sent in stamped envelopes, the internet of value would be a platform for myriad as-yet-unthought-of innovations. Just as nobody forecast social networks, blogging or Netflix in the 1990s, the absence for now of any tangible applications other than bitcoin for the blockchain merely points to humankind's deficient imagination.

All that is needed, blockchain boosters argue, is a "killer app" to find a use for the breakthrough, in the same way that web browsers made the internet useful. Some still think that a currency is the most promising application, but plenty of engineers are throwing other ideas against the wall to see what sticks. CoinSpark, based in Tel Aviv, is among those who want to be able to add messages to the bitcoin blockchain. That would be a way of cheaply notarising information: once something is in the blockchain, it cannot be removed (crypto-geeks post their wedding vows there). Lighthouse, developed by Mike Hearn, a former Google engineer, runs a decentralised crowdfunding platform on bitcoin. Neither of these are killer apps, but they may lead to something bigger.

### Now for the tweaks

Techies are (just about) united in their enthusiasm for decentralised ledgers, but divided on whether bitcoin's blockchain can work in its current form or whether an improved version is needed. Rival blockchains are nothing new: alternative currencies inspired by bitcoin, dubbed "alt-coins", have proliferated ever since it was launched. Some are quasi-Ponzi schemes where the currency's founder (and so default owner of much of the blockchain) profits when he sells bits of it to newcomers. Others have re-engineered Mr Nakamoto's blockchain to make it more suitable for non-currency uses.

Critics point out that bitcoin in its present form can process just seven transactions per second, whereas a large credit-card

*Proponents envisage an "internet of value" that can make money flow as freely as data are flowing already*

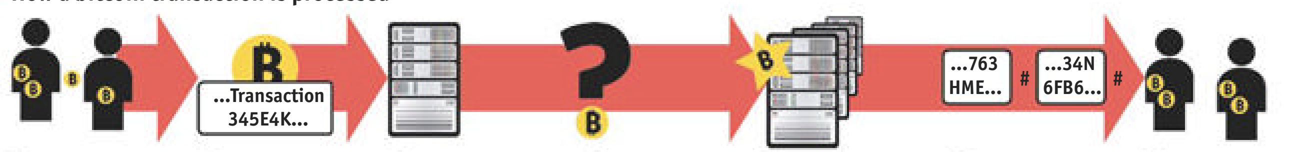
company like Visa can comfortably take on tens of thousands. Users may have to wait up to half an hour for a transaction to be processed, and mining guzzles a lot of power.

But enthusiasts say the blockchain is so robust precisely because of the large number of miners involved, and point out that it has survived untold numbers of cyber-attacks. Alas, using hacker-proof bitcoin requires going through intermediaries such as exchanges to convert real-world currency into crypto-cash, and "wallets" to store it. These have proved anything but secure, which arguably defeats the purpose of bitcoin's trust-free world.

New blockchains far removed from currencies are being spawned. Ethereum, widely seen as the most ambitious crypto-ledger project, wants its blockchain to go beyond transferring value: it should also be able to execute simple tasks such as verifying if a party to a contract has fulfilled its side of the bargain. Its boosters think such a machine could support "smart contracts", where a computer can verify or enforce an agreement. The next step is for robots to go into business for themselves, for example a computer server renting out processing capacity, and using the profits to upgrade itself.

That, for now, is science-fiction. In the short term, distributed-ledger technology is far more likely to be used by incumbents in financial services. The New York Stock Exchange in January bought a stake in Coinbase, a bitcoin wallet, in case stock exchanges decided to go for decentralisation. Banks think that

**How a bitcoin transaction is processed**




1 Payers initiate a bitcoin payment using third-party "wallet" software.

2 This and other pending transactions are broadcast on the global bitcoin network.

3 Every ten minutes or so, specialised computers on this network, known as "miners", collect a few hundred transactions and combine them in a "block".

4 Miners process the block, reaching a consensus on what the new "blockchain" should look like.

5 Miners are rewarded with newly minted bitcoin for providing vast amounts of computing power—giving them a stake in the smooth functioning of the currency.

6 Miners disseminate the new blockchain to the entire network, recording the transactions in the latest block.

7 The payee can use his wallet software to see whether the bitcoin has arrived.

some of the plumbing for settling financial contracts could be decentralised, too, perhaps with their own private blockchains. Payment networks are also keeping an eye on blockchains, attracted by their tiny transactions costs. If a network like Visa were to be built today, it would almost certainly be decentralised, says Jim McCarthy, its head of innovation.

One well-funded new blockchain is Ripple Labs, which wants to enable "secure, instant and nearly free global financial transactions". It is working with financial incumbents to draw up a payment protocol based on decentralised ledgers. Its aim is not to supplant the current financial system but to make it more efficient. "We are builders, not disrupters," says its boss, Chris Larsen, a veteran of the fintech scene who founded Prosper, a lending platform. The problem Ripple is trying to solve is not the omnipotence of the banks but the antiquated way that money is transferred among them. At present two banks in different countries have to use one of a handful of large "correspondent banks" to transfer money between them. With Ripple, they should be able to interact directly.

Seasoned crypto-anarchists are not excited by the idea of reforming the global banks' back offices. Some complain that Ripple is taking an idea with the potential for revolutionary innovation and using it for something far more humdrum. Yet if Ripple succeeds in bringing a critical mass of the banks onto its platform, it will have rendered a service similar to the people who turned a raft of disparate academic computer networks into a single internet in the 1990s. That is not to be scoffed at.

All large banks already have teams poring over blockchain. Many of their back-office settlement platforms seem destined for a move to decentralised ledgers. One barrier is the difficulty of finding staff who can get them up to speed on the technology. "The sort of people who understand blockchains don't usually want to put on a suit and go work for a bank," says Gideon Greenspan of CoinSpark. Because they lack central administrators by definition, blockchain-based systems are unforgiving: there is no helpdesk to reset a lost password, say. Bank bosses may be tempted to stick with the slower, pricier systems they know.

Are blockchains here to stay, in one guise or another? "Just because bitcoin didn't succeed as a currency doesn't mean blockchain will succeed as a technology, but the experiment is important to run," says Patrick Collison of Stripe, a payments processor. The possible uses are legion, but the killer app is still missing. ■

Banks v fintech

# An uneasy symbiosis

**Fintech has made inroads, but the incumbents still dominate day-to-day banking. For how long?**

THE VIEW FROM the 39th floor of One Canada Square, the pyramid-capped central tower of London's Canary Wharf financial centre, is one most bankers would envy. Looking across into other buildings, you can just about see into the corner offices of higher-ups at HSBC, Barclays and Citigroup. The bosses of lesser banks languish dozens of floors below. But this particular floor does not look like a home to financial Masters of the Universe. The trendy decor is reminiscent of a Facebook or Google office, and so are the staff: casually dressed 20- and 30-somethings cluster around MacBooks perched on the tables of a free café. The meeting rooms are whimsically known as "sandboxes", and a bell rings daily at 3pm to invite everyone to help themselves to a freshly baked cookie.

Level39, as it is modishly known, is a startup "accelerator" whose members are mostly fintech companies. In subsidised digs—shoebox offices start at £1,700 a month, hot desks at £325—dozens of small teams work feverishly to become the next Square, Stripe or Lending Club. There are now so many of them that floors 24 and 42 have also recently been turned over to the scheme, set up two years ago by the Canary Wharf Group, the area's developer, to diversify its appeal to a new breed of tenants.

The banks are doing what the old adage tells them: keeping friends close but enemies closer. Not only are a number of them based within a stone's throw of Level39, some also pay for the opportunity to hobnob with its inhabitants. Others run their own startup-mentoring programmes, exchanging cash and staff time for a small stake in a budding enterprise. BBVA, Santander, HSBC and Citi are among those that have set up fully fledged venture-capital-like arms to deploy hundreds of millions on such enterprises.

Most fintechers do not feel half as warmly towards their incumbent rivals. One dismisses them as "the Kodaks of the 21st century", another as "financial vacuum-tube makers in the age of the transistor". They see banks as tomorrow's telephone copper wires, vestiges of an earlier age, and believe that in essence banks cannot adapt. "How often have you seen an incumbent really reinvent themselves?" a startup founder asks. The best thing anyone can say about banks is that they will always be around. "People like to whinge about them but they will never leave," says Neil Rimer of Index Ventures, a fintech investor.

### Bless the current account

And why would they? Day-to-day banking is not such a bad deal. Customers can store their money safely and get at it instantly, usually even from abroad these days if an ATM is to hand (remember travellers' cheques?). They can cash in their pay cheques and settle bills. This costs them little or nothing, and everything is backed by a government guarantee. Banks built the credit society and continue to dominate it. In America about 70% of consumer lending is for mortgages, a sector banks have almost to themselves (thanks in part to government meddling).

Moreover, banks have done fairly well with moving their services onto the internet and then to mobiles. These are two major transitions that have fundamentally changed the way people handle their financial affairs: few industries successfully manage even one. Given their size, banks are perhaps not as incapable of evolution as their fintech critics make out.

So it may not be surprising that fintech has failed to break through in what most people would recognise as day-to-day banking. No startup has successfully made a play for the centrepiece of people's financial lives, the current account. Banks are making a good-enough job of this in a highly regulated environment unappealing to many outsiders. A handful of entrepreneurs have tried. Prepaid payment cards five years ago were seen as a viable alternative to banks, at least for some people, but after a burst of excitement fizzled out. Beyond apps that aggregate data from users' various pots of money to help them budget, the most creditable attempt to date to replicate a bank account was made by a startup called Simple. It was taken over by BBVA last year for just \$117m—or \$0.117 billion, in venture-capitalist language.

Yet bankers who cheered at the capitulation of a fintech darling making a grab for their core business missed the point. The threat the startups pose is not that they will topple banks as linchpins of the economy. Most fintechers are not interested in the complicated, regulated bits of banking. The threat they pose to incumbents is that they might just seize the profitable add-ons, from loans to payments services and investment advice—anything that generates fees. It now seems increasingly likely that they will manage to "unbundle" at least some of these extra services banks offer their clients. That will leave today's lenders with fewer revenues to maintain their costly rump services.

A bank whose customers go to Prosper for loans, Currency Cloud for holiday money and FutureAdvisor for investments will find it increasingly hard to support its existing cost base. For a retail bank, something like half its individual borrowers are already unprofitable. If more of them peel off to fintech newcomers for this and other services, that figure is bound to rise. Any loss of the banks' firm grip on mortgages—which has so far barely been challenged—would certainly be keenly felt.

The most credible part of fintech's *braggadocio* is the comparison drawn between banks and telephone copper lines. It should haunt bankers. In the same way that AT&T, BT and their peers have fought to avoid being turned into "dumb pipes" delivering the vibrant internet's content, unbundled banks may find themselves becoming "dumb stores of value", funnelling money to more glamorous fintech products.

Bankers are well aware of this. They are keeping a close eye on how their products compare with those of the newcomers, and many of them understand their limitations when it comes to innovating. "If you want to come up with a new product in a bank, any one of 50 people internally can shoot it down. If you're a startup, you can go visit 50 venture capitalists and you only need one of them to give it a green light," says Tonny Thierry Andersen, head of retail at Danske Bank.

Even so, the startup ethos is changing the way bankers think about their profession. One common refrain among incumbents is that they need to become less product-focused and more customer-focused, which is true but easier said than done. They also note that customers value transparency.

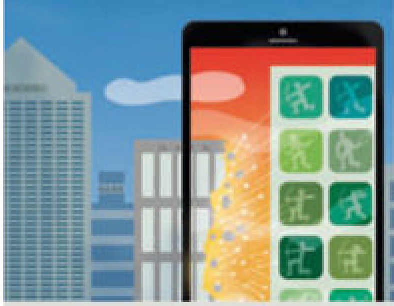
Incumbents are likely to copy, license or buy many of the innovations served up by fintech once they have proved popular. Banks did not invent the ATM but they co-opted it efficiently. Wealth managers will do the same with robo-advisers if they keep attracting new money. For any large financial firm, it would not take more than a few weeks' worth of profits to gobble a fintech star.

***The threat the fintechers pose to incumbents is that they might just seize the profitable add-ons***

Fintech faces many challenges. A lot of startups will fade away when venture capital stops flowing quite so abundantly, as one day it undoubtedly will. Even before that, they will have to prove they can be sustainably profitable, even when credit conditions are less benign. Some services may falter, some may continue to thrive, others will no doubt evolve to work in different conditions.

But for many financial services, the gulf that long isolated banks from competition is being bridged. This is wonderful news for consumers: those who have tested fintech newcomers often gush about the experience, in a way they seldom do after a visit to their local bank branch.

That will prod the incumbents to up their game. Never mind if fintech fails to take over the world, or even the current account: its emergence is changing the face of finance. The all-conquering bluster coming out of places like Level39 is clearly exaggerated. Banks still have a future, but they will have to work harder to make it a profitable one. That is all for the good. ■



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Germany and economics

# Of rules and order

BERLIN

**German ordoliberalism has had a big influence on policy during the euro crisis**

"NO MATTER what the topic, it's four to one against me," laments Peter Bofinger, one of the five members of Germany's Council of Economic Experts, which advises the government. The other four, he says, consider deficits and debt bad, oppose the European Central Bank's quantitative easing as "monetary meddling" and believe austerity is the answer to the euro crisis. In Germany, says Mr Bofinger, "I'm the last Keynesian—and I feel like the last Mohican."

The relationship between Mr Bofinger and his colleagues mirrors the gap that exists between German and Anglo-Saxon (or Latin) views of economics. German thinking on economics has long differed from the mainstream in other countries, including other euro-zone members. In the past six years of euro crisis, the gap has become larger, more visible and more controversial. Sebastian Dullien of the European Council on Foreign Relations, a think-tank, says that this amounts to a "decoupling" of Germany from the rest of the world.

Such a stance leaves economists outside Germany bewildered. Why are Germans sceptical of attempts by the ECB to pep up Europe's economies? Why do they insist on fiscal austerity in countries where demand is collapsing? And why are they obsessed with rules for their own sake, as opposed to their practical effects?

The answers are rooted in German intellectual history, especially in ordoliberalism. This is an offshoot of classical liberalism that sprouted during the Nazi period, when dissidents around Walter Eucken, an economist in Freiburg, dreamed of a better economic system. They reacted against the planned economies of Nazi Germany and the Soviet Union. But they also rejected both pure laissez-faire and Keynesian demand management.

The result was a school that was close both in personal contacts and in its content to the Austrian school associated with Friedrich Hayek. The two shared a view that deficit spending for demand management was foolish. Ordoliberalism differed, however, in believing that capitalism requires a strong government to create a framework of rules which provide the order (*ordo* in Latin) that free markets need to function most efficiently.

From the original ordoliberals sprang one big idea for state intervention when cartels dominated the economy: a muscular antitrust policy. A second was a strict monetary policy that focused rigidly and exclusively on price stability. A third was the enforcement of *Haftung*, which means not just liability but also responsibility. Germany has tougher insolvency laws than America or Britain, for instance.

Through Ludwig Erhard, West Germany's first economics minister and second chancellor, ordoliberalism strongly influenced post-war economic policy. There was a brief flirtation with Keynesianism in the 1960s. But Germany passed its philosophy of antitrust vigour and monetary hawkishness on to the European Union and the ECB. There are ordoliberal fingerprints on the euro zone's stability and growth pact, agreed on in the 1990s as a rules-based way of curbing budget deficits, even if it was a German centre-left government that first breached the pact.

The financial crisis of 2008 exposed the gap between Germany and the rest of the world even more starkly. In America it brought Keynesianism back into fashion. Both George Bush and Barack Obama responded with fiscal stimulus. Germany also adopted fiscal expansion, but many German economists cried foul.

Then, as the euro crisis unfolded, says Mr Bofinger, he was "permanently confronted with ordoliberal positions". Economists outside Germany agree that microeconomic reforms were necessary. But the Germans almost uniquely argued for the anti-Keynesian concept of spending cuts amid declining demand. In Germany itself, a "debt brake" has been written into the constitution, requiring states to balance their budgets by 2020 and limiting federal borrowing (Germany's budget is now balanced at what is touted as the "black zero"). Germany has foisted similar rules on other EU countries through the 2012 fiscal-compact treaty, partly to limit its own liability to them.

Even more characteristic is the German attitude to rules. To some extent, this reflects the country's culture. But it also has an ordoliberal origin. Jens Weidmann, president of the German Bundesbank, often quotes Walter Eucken, especially in passages where *Haftung* "must go hand in hand with" control. This gives German ▸▸

economists an argument for opposing Eurobonds and other forms of debt mutualisation and stressing the euro zone's no-bail-out rule. Similarly, calls for "solidarity" (or fiscal transfers) run straight into concerns over moral hazard. Mario Monti, a former Italian prime minister, likes to claim that in Germany economics is seen as a branch of moral philosophy.

A moral tone certainly creeps into discussions of Germany's current-account surplus, now the world's largest. To non-German economists, huge surpluses represent an imbalance of saving over investment that has counterparts in other countries' deficits and, as the EU's own macroeconomic-imbalances procedure suggests, requires corrective action. To Germans surpluses are signs of economic virtue that merely reflect competitiveness and do not merit any policy response.

Not all German economists see themselves as ordoliberals, of course. But the tradition's influence remains strong at the universities where many study, as well as in the Bundesbank and at the Council of Economic Experts. And just as the original ordoliberals crossed into the humanities and the law, today's have often also trained as lawyers (a pattern that is notable in the finance ministry, for instance).

Critics find the ordoliberal tradition outdated or misguided. "Ordoliberalism is not very practical, it's religion," says Michael Burda, an American economist at Berlin's Humboldt University. Most German economists simply assume, for example, that the minimum wage introduced in Germany will lead to job losses, even though empirical evidence in America and Britain suggests this need not be so.

Ordoliberalism's biggest flaw, says Mr Burda, lies in "failing to do the aggregation step". It is at heart a microeconomic model that disavows macroeconomic policy because it treats countries, or even an entire currency zone, as if they were individual households. It makes sense for individuals to save when they are in debt, as the proverbial Swabian housewife does in Germany. But if all individuals cut spending at the same time, the result can be a shortfall in demand that negates the benefits of microeconomic reforms. Once in a while it is better to break rules than all go under in law-abiding misery. Yet that is not how things are seen in Berlin or Frankfurt. ■

Danish politics

# They love me not, they love me

COPENHAGEN

**Helle Thorning-Schmidt may yet win re-election this year**

THE frequency with which governments announce investment initiatives, job-creation programmes and economy-boosting schemes is a sure sign that an election is in the offing. Danish voters in recent days have been treated to an array of plans, courtesy of Helle Thorning-Schmidt's centre-left minority government. They are part of a new 50-point blueprint that aims, among other things, to revive remote towns with everything from better broadband to easier planning permission. Businesses all over Denmark should also benefit from lower levies on such things as sugar.

As in the other Nordic countries, elections in Denmark tend to be pre-planned. But whereas voters in Norway know to the day when an election will be held because of a constitutional ban on snap polls, Danes know only that they will be called to the polls at some stage before September 14th. Ms Thorning-Schmidt's dilemma lies in picking the best moment to try to return to power for a second term.

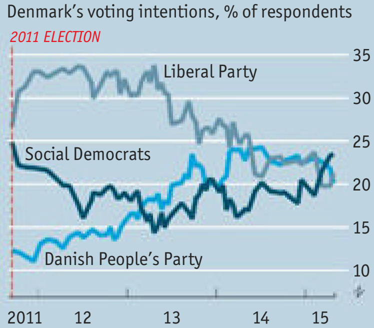
It is not an easy choice. For most of the past four years she has been the underdog in the opinion polls. But recently, thanks partly to a new get-tough-on-immigrants message, she has clawed back enough ground to be in with a chance (see chart). If she now goes for an early vote, in late May or early June, she runs the risk that this momentum will be halted. Summer elections are unusual in a country that takes holidays seriously. Which leaves September, when everybody is ready to get to grips with a new season, as the most likely time. That would also allow the benefits from her initiatives to filter through to voters.

Whenever it comes, the Danish election will not be a showdown between the two biggest parties. A plethora of smaller parties, two of them new, make the outcome impossible to predict. Whether these parties will win enough votes to crawl over the 2% election threshold is critical to Ms Thorning-Schmidt's chances. Meanwhile the far-right Danish Peoples Party (DPP) has overtaken its Liberal Party ally (and heir presumptive should Ms Thorning-Schmidt fail) in at least one poll. The DPP has not yet said if it would try to join a formal coalition.

Whether Ms Thorning-Schmidt can actually win remains a moot point. But she had every reason not to set the date until this weekend. Her husband, Stephen Kinnock (son of Neil), was a Labour candidate in Wales in Britain's election and she apparently promised to be at his side on election night.

**Left back**

Denmark's voting intentions, % of respondents




Sources: YouGov; press reports

France's regions

# New kids on the block

MONTPELLIER

**Redrawing regional boundaries is causing big rows and will save little**

THE monumental neoclassical headquarters of Languedoc-Roussillon is a model of statement architecture. With defiant, muscular authority, it stands across the river from the historical centre of Montpellier, its plate glass glistening in the sun. It also towers over an assembly of faux-Greek esplanades and avenues, the outsized legacy of a former regional president, George Frêche. Under Frêche, who for 27 years was Montpellier's Socialist mayor, the regional government made its mark, and not just in buildings. Between 2005 and 2010, the region's annual payroll costs ballooned from €22m to €108m ($143m).

Now, however, Montpellier is to lose its position as regional capital. As part of an efficiency drive in a country notorious for its *millefeuille* of administrative layers, the government plans to shrink the regions from 22 to 13 in January 2016. Some will keep existing borders, including Provence-Alpes-Côte d'Azur, where Marion Maréchal-Le Pen, grand-daughter of the now shunned Jean-Marie Le Pen, may be the National Front's regional presidential candidate in December. Others are to be reunified, such as the two halves of Normandy.

Elsewhere, the map has been redrawn in haste and amid some controversy. Languedoc-Roussillon has been told to merge with Midi-Pyrenées to form a giant region of 6m people encompassing much of the Pyrenees and the Mediterranean coast. The capital will be Toulouse. Montpellier, where the assembly voted overwhelmingly against the merger, is not pleased. "There needs to be a fair sharing of powers ▸▸

between the two regions and the two cities," says Damien Alary, Socialist president of Languedoc-Roussillon. "It cannot be an absorption of one by the other." If the regional capital is Toulouse, he says, then Montpellier should get the headquarters of other regional public agencies, such as those dealing with health or education.

The merged region, which will keep its existing powers over economic development, transport and schools, has plenty going for it. It has France's fastest-growing population, mainly due to migrants from colder northern parts, and property is cheaper than on the smarter Côte d'Azur. Between 2007 and 2040, the new region's population is forecast to grow by some 28%. Toulouse boasts an aerospace industry: it is home to Airbus. Montpellier is strong in health research. Both cities have been officially named tech hubs. There is a port, albeit a tiny one, at Sète. The region's winemakers like to claim that they plant more hectares of vineyards than Bordeaux or Napa Valley.

All of which is useful for marketing the region to investors. Languedoc-Roussillon spares no expense on this. It has promotional offices in Shanghai, New York, London and Casablanca—and devoted €15m to marketing in 2010 alone, according to the public auditor. Far less clear is whether the merged region will bring budget savings. French public-sector jobs are protected, so there will be no headcount cull after the merger. As it is, the regions employ only 4% of local-government officials, far fewer than departments (19%) or town halls (77%). Those employed in Montpellier have been told they will not have to move to Toulouse. Nor will seats be cut in the merged regional assembly. And, as Mr Alary points out, there will also be extra costs, such as from merging the two regions' incompatible computer systems.

"In practice," says Jean-Jacques Pons, leader of the centre-right opposition in the regional assembly, "there won't be economies of scale, or only at the margin." No candidate in December's regional elections wants to campaign on a cost-cutting platform. Dominique Reynié, a political scientist at Sciences-Po in Paris who is turning to politics as head of the centre-right list, says the merged region is a good idea on its merits, but "should never have been portrayed as a cost-saving reform".

It may be that, with time, the new regions will settle down, forge a new identity, help drive growth—and one day even save public money. But the transition is likely to be bumpy. Quadruple-barrelled names, such as Alsace-Champagne-Ardenne-Lorraine, are indigestible and unlikely to last. Yet French Catalans would be livid if the new south-west region were renamed simply Languedoc. Similar misgivings exist in Picardy, which is to merge with Nord-Pas-de-Calais, and fears being swamped by that region and its politically mighty capital, Lille. "We'll have to drive nearly two hours up the motorway to get subsidies," grumbles a town-hall employee in Picardy. In Montpellier, too, the horse-trading has only just begun. As one official says wryly: "We have to find something for all these people to do." ■

**New and old**

Source: gouvernement.fr

## Italy's constitutional reforms

# Swapping places with Britain

ROME

**Matteo Renzi's electoral reform will hugely strengthen the prime minister**

IMAGINE an Italian café, circa 2023. Matteo Renzi's Democratic Party (PD) has been re-elected to a third term. A customer reads of frantic talks in Britain, where yet another government has collapsed after a few weeks because of the defection of Welsh Nationalists. "*Questi inglesi!*" he mutters. "What a way to run a country!"

Unthinkable? With hindsight, this week might mark the moment Britons and Italians swapped political identities. On May 4th, as Britons braced for a confused election result and a coalition or minority government, the Italian parliament approved a reform that should give Italy long-term political stability and decisive two-party (or even one-party) government.

The new rules will give a party that wins 40% of the vote bonus seats to create a majority of 340 in the 630-seat Chamber of Deputies, the lower house. If no group hits the target, a run-off will be held between the two biggest parties to decide which gets the absolute majority. That seems similar to today's arrangement (though it is the winning coalition, not a single party, that is guaranteed control). But the new law, which applies only to the lower house, is one of a series of reforms planned by Mr Renzi that include the neutering of the upper-house Senate. The electoral change will take effect only in July 2016, the deadline for turning the Senate into an assembly of local representatives.

When that happens, the party that controls the Chamber will control the country. And since the electoral law lets a party leader choose the candidates with the best chance of winning seats, there is little danger of any rebellion against whoever becomes prime minister. Mr Renzi sees this as a formula for the decisive government Italy needs. If he wins the next election (opinion polls give the PD almost twice as many votes as any other party), the prime minister can push a programme of economic and social transformation of positively Thatcherite single-mindedness.

To his adversaries, though, an unshakable majority in what will in effect be a unicameral parliament is a frightening weapon to hand to any politician, let alone one as cocksure and inexperienced as the 40-year-old Mr Renzi. (Before seizing the premiership from Enrico Letta in February 2014, without a fresh election, he was just mayor of Florence.) Renato Brunetta, leader in the Chamber of the conservative Forza Italia, accuses the prime minister of wanting a "one-party state". In his valedictory message to readers, Ferrucio de Bortoli, outgoing editor of *Corriere della Sera*, a daily that traditionally hugs the centre, called Mr Renzi a "young Caudillo", a reference to Spain's General Franco.

Several dozen PD deputies also rebelled. Some belonged to the party's left wing, which objects to other aspects of the government's business-friendly programme and whose members doubtless know that their chances of being picked for the next election are slim. Some, like Mr Letta, have scores to settle. But others share the opposition's alarm. So the government had to resort to confidence votes to ram through its new law. And not even that stopped some of the rebels. They included Mr Letta and the previous two PD general secretaries, Pier Luigi Bersani and Guglielmo Epifani.

Yet the rebellion was not on a scale to rob the government of its majority. So the opposition parties insisted on a secret, final ballot and mostly left the Chamber. The goal was to dispel, for PD rebels, any risk of bringing down the government, allowing the maximum expression of PD discontent. The outcome was 61 votes against the bill, with four abstentions. If 50 of these mutineers were from the PD, that represents almost a sixth of Mr Renzi's party in the lower house. The crucial votes on Senate reform are to come, and in the upper house the government has only a slim majority. The battle is not yet over. But so far Mr Renzi has proved unstoppable. ■

Poland's presidential election

# The harbinger

WARSAW

**This weekend's presidential poll offers pointers for the general election**

THE presidential election on May 10th will set the tone for Poland's general election this autumn. It has been dominated by the long-standing rivalry between the centre-right Civic Platform (PO), which has held power since 2007, and the conservative Law and Justice party (PiS) that it defeated. The PO-backed incumbent, Bronislaw Komorowski, is the most likely winner. But his ratings have dipped to 40%, making it more probable that he will need to win a second-round run-off in two weeks' time against the PiS candidate, Andrzej Duda, who is below 30%.

This week Mr Komorowski was due to take centre stage at events to mark the 70th anniversary of the end of the war in Europe. Yet he has been treading cautiously. He was the only candidate to shun a televised presidential debate. Mr Duda was left to make himself heard among a gaggle of other candidates (there are 11 in all). Mr Komorowski's team have released a clip reminding voters of Mr Duda's conservative views on in-vitro fertilisation, to which the Catholic church is hostile, but which a majority of Poles support.

Yet again the left has failed to make much of a showing. The Democratic Left Alliance (SLD), descended from the former communists, took a gamble by nominating Magdalena Ogorek, a 36-year-old historian and television personality. But she has failed to appeal to voters, winning ratings as low as 3%. To add insult to injury, she has distanced herself from the SLD, calling herself "an independent".

The dark horse is Pawel Kukiz, a 51-year-old former rock musician who courts voters fed up with the main parties. He is in third place, with one poll giving him 11% support. "Poland has the same problems as 90 years ago," Mr Kukiz said in a campaign clip that opened with an old radio broadcasting a speech in 1924 by Jozef Pilsudski, Poland's interwar leader. In place of lists he wants single-member constituencies, which he calls the "start of responsibility in politics". In a recent interview Mr Kukiz said he would not endorse a second-round candidate "who reinforces PO's omnipotence".

Both PO and PiS have their minds on the forthcoming general election. The polls put PO ahead, but neither party looks likely to be able to govern alone. PO's leader, Ewa Kopacz, who took over last autumn when Donald Tusk went to Brussels as European Council president, may need her current coalition partner, the agrarian Polish People's Party. PiS has fewer choices: it may have to talk to anti-system figures such as Mr Kukiz or Janusz Korwin-Mikke, a 72-year-old radical and member of the European Parliament who is running for president. Jaroslaw Kaczynski, the veteran PiS leader, has called Mr Korwin-Mikke "a component of the pathology of Polish public life" and likened him to Vladimir Zhirinovsky, a far-right Russian politician.

For now, PiS is concentrating on getting Mr Duda into the second round. If it succeeds, the party's spokesman predicts "two weeks that will shake Polish politics". A televised confrontation, in which the president has said he would take part, could have a big impact. In the first round, disgruntled voters may hand Polish leaders a "yellow card" by picking outsiders, says Jaroslaw Flis, a sociologist at Krakow's Jagiellonian University. In a second round, it will be up to Mr Komorowski and Mr Duda to win them over, "with hope or with fear". Whoever wins may presage a victory for his party in the autumn. ■

Turkey and the Kurds

# The mule killers

ISTANBUL

**The army guns down mules for allegedly helping PKK rebels**

THE Turkish army has fought on and off against rebels of the outlawed Kurdistan Workers' Party (PKK) since 1984. It is now hunting down their allies: mules. Turkish soldiers have killed at least 32 since March 23rd. Eight others tumbled off a nearby cliff as they fled the shooting. The slaughter is centred in Ortasu, a village in the mountainous south-eastern province of Sirnak, bordering Iraq. Animal-rights activists have protested, but to no avail.

The army says the crackdown is aimed at curbing a flourishing trade in contraband cigarettes, which helps to finance the PKK. Villagers deny any connection with the rebels. They say they resort to smuggling because there is no other work. Local officials who turn a blind eye are given a cut.

The agriculture ministry claims the animals are being put down because they carry disease. Their owners deny this, saying the campaign is a new form of repression of the Kurds. "Nobody came and checked our animals to see whether they were ill, they just shot them," fumes Veli Encu, a self-appointed spokesman. "State-sanctioned murder in Roboski never seems to end."

Mr Encu is referring to what happened in Roboski (the Kurdish name for Ortasu) on December 28th 2011, when Turkish fighter jets rained bombs on a group of villagers as they made a nocturnal run across the border. Some 34 villagers and 59 mules were blown to bits. "We couldn't tell the animals from the humans," recalls Mr Encu, who lost 11 relatives, including his 13-year-old cousin, Bedran.

An official inquiry found that the attack was based on bogus claims that a PKK commander was hiding among the group. Yet the affair was buried: just one officer lost his job. The victims' families have refused state offers of compensation, saying their silence cannot be bought. "Roboski is testimony to the persistent lack of state accountability in Turkey," says Emma Sinclair-Webb of Human Rights Watch, a watchdog. So is shooting animals.

Mules are more than just commercial assets. As Mr Encu says: "They carry our sick, they carry our brides—and they carried back the fallen on that horrible night."

Blameless victim—or wicked smuggler?

An Odessa file

# Black Sea woes

ODESSA

**The aftershocks from a year-old tragedy make Odessa a test for the new Ukraine**

ALMOST exactly a year ago, on May 2nd 2014, two groups of protesters clashed in central Odessa. A heady post-revolutionary haze hung over Ukraine. A weak government had taken power in Kiev after the Maidan protests had forced President Viktor Yanukovych to flee the country. Russia had annexed Crimea and pro-Russian rebels were taking over parts of the eastern Donbas region. Odessa, with its many Russian-speakers, might have been next.

Masked pro-Russian demonstrators then opened fire, scattering the pro-Ukrainian crowd. The pro-Ukrainians regrouped and pushed back to Kulikovo Pole, where pro-Russians sheltered in the Soviet-era trade-union building. Molotov cocktails flew and the building erupted in flames, trapping hundreds inside. Elena Radzikhovskaya, a local history professor, went to search for her son Andrei, who had joined the protests. She called him but, she says, "A strange voice answered and told me, 'Your son is dead'." A year later, Ms Radzikhovskaya still wears black.

At least 48 people died in the clashes. Six were Maidan activists killed in the first skirmish; the rest were pro-Russians, most of whom died in the trade-union building. These events scarred Odessa, and provided prime propaganda for Russia. Many separatists fighting in eastern Ukraine today say May 2nd was the day they decided to take up arms. Maidan activists in Odessa retort that it saved the city from a worse fate. "May 2nd is our victory," says Mark Gordienko, a local Maidan leader. As for those who died in the fire: "Screw them." But the wounds still fester. "This is a post-traumatic society," says Zoya Kazanzhy, an adviser to the governor. On both sides, she adds, "radicalisation is deepening".

Clashing memories and an amateurish investigation have marred the healing process. Ukraine's president, Petro Poroshenko, has called the inquiry "a test of justice for the law-enforcement organs". Human-rights activists say they have failed so far. Nobody has been convicted on charges connected to May 2nd. There is no official list of the dead. The evidence collected is thin. Investigators searched the trade-union building for a mere six hours the day after the fire, and then left it open to the public. For 16 days it was looted and defaced. By the time police put up a permanent perimeter barrier, the crime scene had been irreparably compromised. The ensuing detective work was inept.

The most reliable inquiry has come from independent journalists in the so-called May 2nd group. Official organs are "incapable of bringing this case to a just end", says Sergey Dibrov, one of the group's investigators. Many see politics interfering with justice. Of 22 people now on trial, only one comes from the pro-Ukrainian side. As for the police, "The function of our law-enforcement agencies became corruption, not investigation," says Mr Dibrov, noting that one witness asked to identify a suspect in a photo line-up was shown a picture of him alongside images of Ben Affleck and Bruce Willis.

The authorities have cracked down on pro-Russians in Odessa. A string of bombings of pro-Ukrainian groups have killed only one person, a bomber, but they have also put the city on edge. The security services claim to have foiled a Russian-led plot to launch a "Bessarabia People's Republic". In the run-up to the first anniversary of May 2nd, dozens were detained. On the day itself, thousands of soldiers and police were deployed around the city, reassuring some but rankling others. "They aren't guarding us, they're guarding themselves from us," complained a mourner at the Kulikovo Pole memorial.

Most of Odessa's pro-Russians have been arrested, driven out or frightened into silence. Billboards encourage residents to inform on everyday separatism. Yuri Tkachev, editor of Taimer, a pro-Russian website, declares that "the authorities are digging themselves into a hole by not letting these people and ideas express themselves in a safe form. It may then appear in a dangerous form."

A parallel power structure has been built from Kiev's Maidan movement. During the revolution, self-defence groups played a big role, but now their presence carries its own risks. Mr Gordienko half-jokingly calls himself a "patriotic pirate", and speaks of an alliance with Odessa's powerful criminal underworld against the pro-Russians. Groups like his have taken the law into their own hands. During a night patrol earlier this month, one team roamed the city in a silver SUV with spoof licence-plates reading, "Putin is a dickhead, la-la-la-la-la". The vigilantes listen in to police radio and intercept calls, competing to arrive on the scene first. They claim to answer to themselves, the people and some vague notion of justice.

Yet for all their mutual hatred, the two camps share two sentiments: a love for Odessa and a deep distrust of all those in power. Pro-Russian activists, having seen the destruction in the Donbas, have a strong incentive to refrain from steps that could lead to all-out war. At the same time Maidan groups speak openly of their disappointment with the dithering new government in Kiev.

The regional governor, Ihor Palitsa, has drawn praise for his handling of the May 2nd anniversary, which passed peacefully, but he is a compromised figure because of his close ties with Ihor Kolomoisky, a powerful oligarch. The government's failure to investigate and prosecute most of those responsible for the crimes of May 2nd, and its failure to deliver the Maidan revolution's promises, may pose the greatest threat of all to Odessa. The kindling is stacked; it needs only a spark. ■

**In memory of a murderous fire**

# Charlemagne | The sorry saga of Syriza

**In its first hundred days Greece's government has failed dismally. A crunch looms**


IN RECENT months the walls of the B. & M. Theocharakis Foundation in Athens have been lined with mementoes of European support for Greece's freedom. "Philhellenism", an exhibition, tells the story of the material and moral backing that Romantics like the English poet Byron gave Greece during its independence fight against the Ottomans. The contemporary resonances are obvious. Showing some children around, Dimitra Varkarakis, who with her husband, Michael, owns the works on display, pointed to a German painting. One girl stopped short. "Aren't we in a fight with Germany?" she asked. "No," replied Mrs Varkarakis. "We are all friends." After recounting this tale she casts Charlemagne an earnest look. "Europeans," she says, "must love each other."

That is a noble aim, for some Europeans have lately struggled even to speak to each other. Two weeks ago, after a particularly disastrous meeting, Yanis Varoufakis, Greece's finance minister, declared that he welcomed the hatred directed against him in the euro zone. After more than three months of fruitless negotiations with Mr Varoufakis, the reserves of Philhellenism among Greece's partners have run utterly dry. "They are living in cloud-cuckoo land," says one Brussels official.

Perhaps it was naive to expect anything else. A few years ago many of the men now in charge spent their time discussing the contradictions of capitalism over coffee and cigarettes. Few had ever run anything, let alone a government. Their European contacts were limited. Syriza, their party, typically won only 3-4% of the vote. But Greece's economic calamity transformed its prospects. In 2012 it came within a whisker of power. And after January's election it went one better, forming a governing coalition.

Syriza, under the leadership of the new prime minister, Alexis Tsipras, offered an attractive promise to a country battered by recession and humiliated by years of tutelage at the hands of foreign bureaucrats. Mr Tsipras promised to tear up the bail-outs, restore Greek dignity and keep the euro (as the vast majority of Greeks want). Greece might also, ministers mused, change the rules of euro-zone governance, to the benefit of all Europeans.

Three months on, the first two of these pledges are in tatters, the third looks shaky and the fourth is a bad joke. Less than a month after the election, Greece agreed to extend its second bail-out until the end of June, in the hope of securing the €7.2 billion ($8.1 billion) left in the kitty. The abrasive approach of Mr Tsipras and Mr Varoufakis since then may have played well at home, but abroad it has won Greece nothing but mistrust and scorn.

This has had two results. First, the conditions attached to any further loans Greece needs will be even more onerous. Second, the architects of the bail-outs, who were wrong in insisting on forcing austerity on depressed economies, seem more secure in their arguments than ever. "Syriza has done a terrible disservice to all of us who have been trying to change the debate in Europe," says Loukas Tsoukalis, president of Eliamep, a Greek think-tank.

A Grexit is still unlikely. But it is little wonder people are now planning for one. Having received no bail-out money since August 2014, the government has raided municipal funds and delayed payments to suppliers to keep its head above water. But it cannot go on inducing palpitations with the approach of every IMF and pension-payment deadline. Officials in Brussels and Athens agree that Greece cannot get beyond May without help. After that, it faces huge repayments to the European Central Bank in July and August, for which a third bail-out may be needed.

That has concentrated minds. Mr Varoufakis, whose hectoring style infuriated the Eurogroup of finance ministers, has been sidelined. Talks in Brussels are getting down to detail. Some hope for a deal soon (if not before the Eurogroup meeting on May 11th). But Syriza insists it will not cross two red lines: on pension cuts and the rules governing lay-offs (on the latter, it has half a point).

All of Mr Tsipras's options look bad. He could delay a payment to the IMF to buy time. He could continue a game of chicken, perhaps slapping capital controls on Greek banks. Or he could do a *kolotoumba* (somersault), conceding creditors' demands for the sake of Greece's euro membership. That might require a referendum. It could also split Mr Tsipras's party. There is a plethora of possibilities, but one way or another a reckoning is imminent.

### Dreaming that Greece might still be free

What explains Syriza's intransigence? Greek observers offer a range of answers: incompetence, ideological blinkers, satisfying domestic demands for toughness. It may also have overestimated its hand. Whatever the reason, the uncertainty has cost Greece dear. Last year it returned to growth; this week the European Commission cut its forecast for 2015 to just 0.5%, and that assumes a deal will be done. The government is skint, foreign investment has dried up and a small primary fiscal surplus has been wiped out, raising the prospect of yet more hated austerity.

On top of this, there is no longer much hope that Syriza will tackle the chronic pathologies of the Greek state. The government has failed to defang the country's oligarchs and is reversing some valuable reforms from recent years. An old Greek disease, clientelism, seems as pervasive as ever. To Potami, a liberal party, discovered that 11 of the 13 regional directors of education appointed by the government were Syriza members. (One of the others belonged to its coalition partner.)

In almost every way, Syriza has brought the opposite of what it promised. It vowed an end to depression in Greece. Instead, growth has slumped. It pledged to end austerity politics in Europe, but has done more to embolden its advocates than any German could have hoped. It promised to jettison the bad habits of old parties, and seems instead to have acquired them. Back at the Athens museum, perusing a catalogue of his Philhellenic collection, Mr Varkarakis is downbeat. "Two hundred years ago, everyone loved Greece," he says. "Now…" His voice trails off. ■


Also in this section



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The economy after the election

# The climb to come

**The recovery will not be complete until interest rates rise**

WHEN in March 2009, after the meltdown of the financial system, the Bank of England cut interest rates to 0.5%, it could not have imagined that they would remain unchanged six years later. But when on May 13th Mark Carney, now governor of the bank, breaks his election-induced silence to deliver his quarterly inflation report, the story will be a familiar one. Barring some unexpected shift, Britain's easy money marathon will continue.

That rates have remained low is testament to the fitful nature of Britain's recovery. When the Conservative-Liberal Democrat coalition came to power in May 2010, the recession was over. But for two years the euro-zone crisis buffeted the economy, holding down growth. Even in the face of 5.2% inflation in 2011—the result of soaring energy and food prices—the bank kept its foot on the pedal. Growth at last accelerated in 2013—but not enough to use up all the economy's slack. As a result, David Cameron is the first prime minister since Clement Attlee, who left office in 1951, to serve an entire term without rates rising.

**Prepare for take-off**

Forecasts, %


*As implied by overnight index swaps forward curve

Source: Bank of England †February Inflation Report

Britons could be forgiven for wondering if this will all continue after the election. Inflation, after all, is at zero, an historical low, thanks to cheap oil (the bank's target is 2%). It will probably turn negative soon. And despite growth of 2.8% in 2014, the timetable for interest-rate rises has continually slipped. Less than a year ago markets expected rates to exceed 1% by now. Today a rise to just 0.75% is not priced in until the middle of 2016 (see chart).

In part, that reflects global trends: in America the Federal Reserve has pushed back rate rises, too, while the ECB launched a quantitative easing programme this year. The Bank of England will only hike rates after the Fed, reckons Goldman Sachs, a bank, partly to avoid an appreciation in the pound and more deflationary pressure. But the Fed is expected to raise rates in the second half of 2015, clearing the way.

If that happens, tightening in 2016 looks likely, for two reasons. First, inflation will reappear suddenly at the end of 2015 as cheaper fuel and energy drops out of the year-on-year comparison. The effect of roughly a 10% trade-weighted appreciation in the pound since mid-2013, which made imports cheaper, will also dissipate.

Second, and most important, spare capacity in the economy is being used up. When unemployment is high, the economy can grow fast without causing much inflation, as firms take on more workers. By growing this way, Britain has created a remarkable number of jobs. Some 1.2m more people are in work than at the start of January 2013. Unemployment is down from a peak of 8.5% in 2011 to 5.6% today.

But time is running out on this growth model. In February the bank estimated the medium-term "equilibrium" rate of unemployment to be about 5.5%. Once that tantalisingly close threshold is crossed, firms might struggle to fill vacancies without hiking pay (though the bank has been wrong before on when wage growth will return).

## A deserved bonus

Wage rises triggered by a tight labour market may sound like good news for Britons who have been squeezed by six years of falling real pay. But if driven by a hiring frenzy, pay rises would probably be passed on to consumers in the form of higher prices. Workers' hopes should instead be pinned on growth in productivity—the amount produced every hour.

Productivity growth has been the missing ingredient of Britain's economic recovery. In 2014 output per hour worked was 1.3% lower than in 2011, and some 14% beneath its pre-crisis trend. Much like predictions of interest-rate rises, forecasts of a return to productivity growth have come and gone. If productivity had grown as predicted by the Office for Budget Responsibil- ▸▸

Britons were voting in a general election as *The Economist* went to press. Digital editions will be updated on Friday morning with our coverage of the result. To read this updated edition, please delete and re-download this week's issue by tapping and holding on the cover until a waste bin appears, tapping it and then tapping "Download". Or see our special online election hub: **www.economist.com/ukelection2015** ity, Britain's fiscal watchdog, in 2010, it would be 8.4% higher than it is today.

In the short-term, productivity growth brings down inflation, as firms' costs fall. At their April meeting, the Bank of England's rate-setters warned that if economic growth continues apace, productivity must improve or inflation will rise.

That raises an alarming possibility: interest-rate rises even as productivity and real wages continue to stagnate. Households with floating-rate mortgages would not welcome that. In a survey the bank commissioned in 2014, 37% of Brits with mortgages said they would need to cut their spending or work longer hours if rates rose by two percentage points but their incomes remained the same.

Fortunately, that grim scenario is unlikely to be played out, for two reasons. First, without productivity and wage growth, the new government will raise less in taxes. That means more spending cuts would be necessary to close the deficit. The Bank of England would have to offset any additional cuts by keeping rates low for longer. Second, without real-wage rises it is unlikely that consumer spending would be buoyant enough to stoke much inflation. It seems more likely that productivity and interest rates will rise together.

**Get ready for the hard bit**

Britain's economy is in a much healthier state than in 2009. With unemployment down and the economy growing, there are plenty of reasons for optimism. But the recovery will not be complete until interest rates are safely away from zero. And without productivity growth, the economy could—like a marathon runner in the final stages—find itself hitting a wall. ■

Politics

# Lots to do

**Britain's next government inherits a pile of tricky decisions from the last one**

DESPITE initial predictions that it would quickly collapse, the coalition government that led Britain from 2010 was remarkably stable. There were few major bust-ups, rebellions by backbench MPs never tipped into outright revolts and most of the policies in the initial agreement between the Conservative and Liberal Democrat parties were implemented. Partly this was thanks to maturity on the part of the two party leaderships. But it also owed something to their breezy willingness to postpone and fudge decisions where it suited them.

As *The Economist* went to press, Britons were going to the polls in their general election and it was not yet known what sort of administration would replace the coalition. But it is clear that, thanks to the last government's can-kicking, a heaving in-tray will await the new one.

Some of its contents betray the ideological rifts between the two parties in the last government. To avoid a clash between pro-disarmament Lib Dems and the more hawkish Tories, for example, in 2010 a decision on committing the bulk of the investment needed to renew Britain's "Trident" nuclear deterrent was delayed until this year's post-election Strategic Defence and Security Review (SDSR). The new government will have to commit to the roughly £20 billion ($31 billion) that this will cost, opt for a cheaper alternative or delay the decision further, a move that would incur its own costs. In the SDSR it will also have to set budgets for the armed forces, including reaching a decision on whether Britain will meet the NATO target of spending 2% of GDP on defence.

Other politically sensitive questions were also deferred. The next government may face a showdown with the media over the adequacy of Britain's new press-regulation regime, set up following the revelation in 2011 that certain newspapers had illegally accessed private phone messages. It will also have to confront one of the legacies of last year's Scottish independence referendum. After the vote, powers were devolved to the Scottish Parliament at Holyrood, exacerbating the problem known as the "West Lothian question", whereby Scottish MPs in Westminster can vote on bills that affect only English constituents.

More parking space needed

Sometimes choices were not neglected because of ideological tensions but because decisions would have simply been electorally risky. Within months the report by Sir Howard Davies into the best place to build new airport capacity for London will thud into the in-tray of the newly formed government. The most likely proposal—expansion at Heathrow Airport—is desperately unpopular in a swathe of Lib Dem and Tory seats in the south and west of the capital, so the coalition kicked the issue into the long grass by appointing the grandee in 2012.

It was the same story with high-speed rail. Though a bill approving the pricey "High Speed 2" link between London and Manchester was passed in the Commons last year, it has not yet become law. The new government will have to decide whether to delay progress (perhaps indefinitely), or push ahead with legislation in the face of continued opposition.

On occasion, the contents of the next government's to-do list are there for good reason. The biggest of these is the budget deficit. In 2010 the coalition government set out to eradicate this within one parliament. In practice it only halved it, rightly slowing the pace of spending cuts mid-term in response to sluggish economic growth. Britain borrowed about £90 billion in the 2014-15 fiscal year, and spent more on debt repayments than it did on schools. One of the new government's first acts will be to lay out an "emergency budget" setting a path for deficit cutting over the 2015-20 parliament.

The deficit aside, many of the reasons that prevented the last government from dealing with the items in the new government's in-tray still apply. Airport expansion is still politically contentious, high-speed rail is still very expensive, and the future of Trident still divides Westminster. And yet postponing them further is, in many cases, not an option—or, at least, deeply inadvisable.

Parliament also faces another difficult decision: about where it will reside. The Palace of Westminster, home to the lower and upper houses, is falling apart. Fixing it could cost the taxpayer £3 billion and may mean that MPs have to move the whole business of government elsewhere for five years while the electrics are replaced, the windows fixed and the leaks plugged. Authorities at Westminster say that if work is not begun by next year, the building will start to become unusable. Without anywhere to legislate, progress on the other items in the new government's in-box will be even slower. ■

Climate and the weather

# Is it global warming or just the weather?

**Scientists are getting more confident about attributing heatwaves and droughts to human influence**

EARLY this year, touring a drought-stricken fruit farm in California, Barack Obama cited the state's three-year dry spell, the worst on record, as an example of the harm that climate change can cause. Politicians like this sort of pronouncement. David Cameron, Britain's prime minister, said in 2014 that he very much suspected that climate change was behind floods in parts of the country's south-west. In contrast, climate scientists have been ultra-cautious about attributing specific weather events to global warming. Because the weather is by its nature variable, it is impossible to know whether climate change caused any particular drought or flood. So the scientists have steered away from making firm connections.

Until now. A new branch of climate science is starting to provide answers to the question: was this drought (or heatwave or storm) at least partly attributable to climate change? In some cases, the answer seems to be a cautious yes. As the research progresses, it could change public perceptions and government policy.

For years, the central debate of climate science has focused on how much global mean surface temperatures would rise by 2100. This is so important that a target for mean temperature rises is likely to be embodied in an international treaty to be signed in Paris later this year. The increase in the mean is the simplest way to measure the long-term impact of climate change. But it has drawbacks. It makes global warming seem like something that will happen in 100 years' time. Most people do not think about global temperatures but local ones. And climate change affects ecosystems not just through increases in the mean, but also through changes in the extremes—more intense droughts, say. Extremes also have a profound impact on people: a heatwave in 2003 caused about 70,000 premature deaths in Europe. Focusing on links between climate change and the local weather thus makes sense in terms of both science and public understanding.

In principle, attributing the weather to climate change might seem straightforward. The two are so closely related that the climate can be defined as the average daily weather over a long period (or, as Edward Lorenz, a mathematician and meteorologist, once put it, "climate is what you expect; weather is what you get").

**Of butterflies and bad weather**

In practice, though, there are so many influences upon the weather—famously expressed by Lorenz's idea of a butterfly's wingbeat in one part of the world causing a hurricane in another—that isolating any individual factor is hard. That remains true. It is not possible to say categorically that climate change has caused any individual storm, flood or heatwave.

But scientific attribution does not require certainty; it deals in probabilities. Even now, doctors cannot be sure that a case of lung cancer has been caused by smoking (the patient might have got the disease anyway). Nevertheless, it is possible to say that smoking increases the risk of cancer by a certain amount and that smoking causes cancer in a general sense. In a similar way, scientists are now able to say that climate change increases the risk of a particular weather pattern by a measurable amount and, in some cases, that a particular episode is almost impossible to imagine without global warming. That is as near as you can get to saying global warming caused a weather event.

The science of weather attribution started in 2003 with an article in *Nature*, "Liability for climate change" by Myles Allen of Oxford University. It showed that human contributions to climate change can be calculated by looking at what the climate would have been like if people had not increased greenhouse-gas emissions. That meant comparing observations of the weather with computer models of what might have happened without climate change. Much climate science depends on such models, which describe the complexities of the climate. By running them using different assumptions (for example, no increase in greenhouse-gas emissions, or more volcanic activity), and comparing the results with reality, it is possible to reveal the probable effects of the emissions. With lung cancer it is possible to compare groups of smokers and non-smokers; with climate change computers have to simulate the equivalent of the non-smokers.

The trouble is that weather observations are limited and climate models imperfect. Dr Allen showed that, by quantifying the uncertainties, you can calculate the probability of a weather pattern occurring. That made it possible to say that man-made climate change made this or that weather event twice as likely, five times more likely, or less likely.

Dr Allen argues that the study of weath- ▸▸

er attribution followed naturally from the establishment, in the 2000s, of a scientific consensus that humans are largely responsible for climate change. Heidi Cullen of Climate Central, an American research group, points out that there was also a technical contribution. The climate is global and climate models are, too. Weather, on the other hand, is local—and until recently models were not precise enough to describe it. In the past few years, though, it has become possible to impose a finer grid on the global picture. Computers have become powerful enough, and enough data have been collected, to describe what is happening in an area as small as 25km by 25km. The result has been the development of regional climate models.

**Turbulence ahead**

Most of the episodes that have so far come under the microscope have been large, long-lasting ones, such as Australia's heatwave in 2013, or California's continuing drought. But one study, by Hans von Storch of the Institute of Coastal Research in Germany, looked at a storm that passed through northern Germany and southern Denmark in 2013 and lasted less than a week. (It found no evidence of human influence.) Traditional climate research is a little like epidemiology, the study of disease at the level of the population; Dr von Storch's study was a bit like an autopsy.

The number of such studies is proliferating. Dr Allen's outfit at Oxford has put its regional climate models online so anyone can download them. Hundreds are doing so, running their own studies and making this project, called weather@home, one of the largest examples of "citizen science" in the world. The science of weather attribution now has a network of researchers and a group of institutions which shapes the studies (in addition to Oxford and Climate Central, it includes the University of Melbourne, America's National Oceanic and Atmospheric Administration and the Royal Netherlands Meteorological Institute). There is also an academic journal which publishes most of them: the *Bulletin of the American Meteorological Society* (BAMS).

Though the groups use somewhat different approaches, their conclusions are strikingly similar. The strongest evidence for human influence can be seen in heatwaves, such as Australia's "angry summer" of 2013, when average temperatures were 1.5°C above the norm for 1911-40. In a study in *Geophysical Research Letters*, David Karoly of the University of Melbourne argues that it is possible to say with considerable confidence that human influence increased the risk of such high temperatures fivefold, at least. The heatwave of 2013, he argues, would have been "virtually impossible" without climate change.

The most recent BAMS contained nine studies of heatwaves in 2013, including in Europe, China, Japan and Korea. All showed that man-made climate change had increased the likelihood of exceptional heat. In Korea daily minimum summer temperatures were 2.2°C above the 1971-2000 average; the study found that climate change had boosted the chance of this happening tenfold. Germany is likely to have a summer as hot as that of 2013 about once in seven years now; before industrialisation the odds were one in 80. For Europe, the odds rose even more, by 35 times—the result of changes to ocean currents and the great Arctic melt, and to emissions of greenhouse gases and aerosols (which, like the melting of Arctic ice, are influenced by natural variability, as well as humans).

You would expect more heatwaves with more global warming; they are two sides of the same coin. But climate change also seems to be contributing to droughts, though the evidence here is weaker. The link is intuitively plausible: higher temperatures speed up evaporation, reduce soil moisture and lead to drought. One BAMS study of California also found that atmospheric pressure patterns associated with droughts in the past are becoming more likely than they would be without greenhouse-gas emissions.

On the other hand, another study concluded that global warming increases the risk of drought in California in some ways but decreases it in others, leaving no net change. Forthcoming research on drought in south-east Brazil suggests other sorts of human influence, such as population growth and water consumption, also matter. Of four studies of droughts in the most recent BAMS, two showed that man-made influences were increasing the risk; two found no link or an uncertain one.

The evidence is weaker still when it comes to storms. It is often said that climate change is making hurricanes and other intense storms more frequent. But the BAMS researchers looked at three unusual storms in 2013—the one in northern Germany; a blizzard in South Dakota and autumn snow in the Pyrenees—and found no evidence of human influence in any of them.

In an attempt to give the overall picture, a new study in *Nature Climate Change* by Erich Fischer and Reto Knutti, both of the Federal Institute of Technology in Zurich, moved away from individual events to consider heatwaves and rain storms in general. They took all the heat and precipitation extremes between 1901 and 2005, defining extremes as events likely to occur once every 1,000 days. By running the climate models with and without climate change, they found that 0.85°C of warming (the rise since the industrial era began) has made such heat extremes four or five times more likely, roughly the same as in the Australian study. The authors attribute 75% of the heat extremes, and 18% of the precipitation extremes, to observed global warming. Worryingly, the risk of an extreme event seems to rise exponentially as mean temperatures creep up. The probability of a heat extreme is twice as great at 2°C of warming than at 1.5°C.

That does not mean, alas, that the science of weather attribution will be able to forecast particular droughts or heatwaves, only to say that more of them are likely to happen. That is a useful addition to climate science. People are routinely told about—and routinely ignore—the bad things they are doing to the climate. The attribution studies show that the climate is doing bad things back. ■

No act of God

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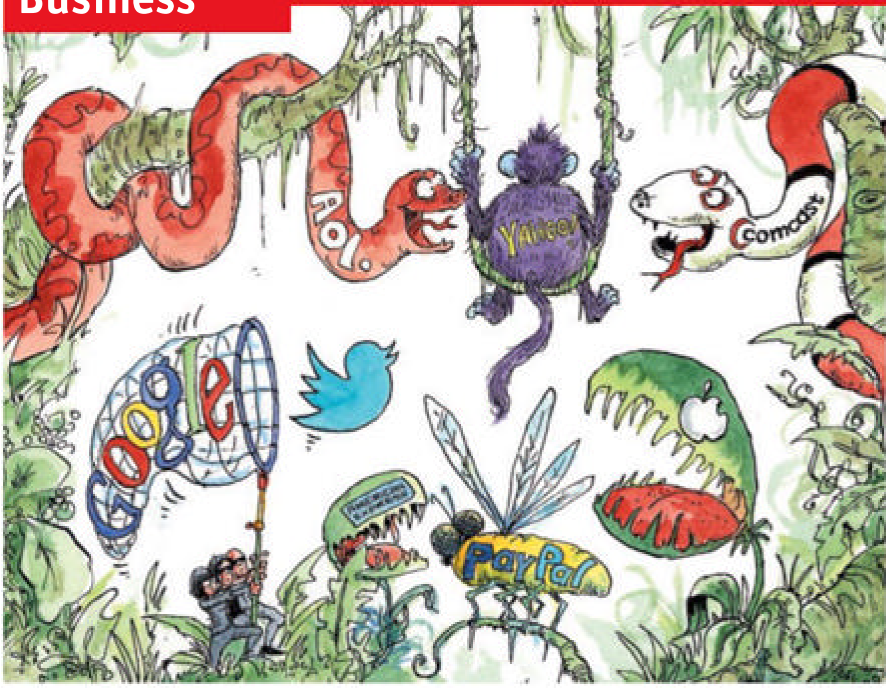


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Internet firms

# Eat or be eaten

SAN FRANCISCO

**With a wave of consolidation in prospect, America's big internet firms look set to divide into predators and prey**

EVEN at charity auctions, technology titans like large transactions. At a recent fundraiser for Tipping Point, an anti-poverty charity in San Francisco, guests swiftly bid up the price for a package of Super Bowl tickets in increments of $100,000. The fortunes made by Silicon Valley entrepreneurs are so vast that the event effortlessly raised $14m. Guests tossed yellow confetti round the room in celebration.

Companies in the Valley are big spenders too. Last year around $184 billion of mergers and acquisitions were struck in the American technology industry, according to Dealogic, a research firm. There will be even more this year. This week speculation grew that Salesforce, a provider of cloud-based business software, had received several approaches—Microsoft and Oracle were said to be among those interested, though another, SAP, ruled itself out. Recent stumbles by Twitter and LinkedIn make them vulnerable; and a number of other internet firms are big enough to be an appetising prospect, but not too big to be swallowed up. Unlike, say, Google, most do not have founders with controlling stakes that could prevent a takeover.

With a current stockmarket value of $48 billion, Salesforce would not come cheap. But many of America's biggest technology firms are rolling in money: Microsoft, for one, has $95 billion in cash and short-term investments on its balance-sheet. Among the top ten American firms with the largest cash hoards (excluding financial firms), six are technology firms, led by Apple, and they have saved up a combined $485 billion. This, plus their high share prices, gives the tech industry's potential predators unprecedented firepower as they go hunting. Furthermore, a variety of other companies, from old-media firms to Chinese tech giants such as Alibaba and Tencent, are also scouting round the Valley with the intent of getting more familiar with American online businesses.

Although exuberance about the internet sector's growth prospects has lifted the shares of many firms, doubts are growing about the ability of some to continue their impressive winning streaks. Recently Twitter and LinkedIn, two social networks, missed earnings forecasts, sending their shares falling by around 28% and 21% respectively. Sustained underperformance could drive down public firms' prices and make some of them easier targets.

With a $24 billion market capitalisation (down from around $33 billion a month ago), Twitter is still a large bird to swallow; and it has been buying up smaller firms over the past few years to help it grow. However, its management has disappointed investors, who had hoped the firm would scale up faster. Unless that changes, another internet firm could swoop.

Google is the most obvious buyer. Twitter's main problem is that advertisers still see it as a niche proposition. Google, the giant of online ads, could help solve this. The relationship between the two firms is growing closer. When Twitter reported its earnings on April 28th, it announced a partnership with Google to help it sell and measure the effectiveness of ads. Tencent, a Chinese firm that owns a popular messaging service, WeChat, may also be interested, although the American government would cringe at seeing a platform for free speech go to a Chinese owner.

Midsized, advertising-supported firms have struggled of late, as it has become clearer that some will not add users and revenues as quickly as once hoped. In other words, online advertising can be a tough business for firms "that are not named Google or Facebook", says Brian Wieser of Pivotal Research, who studies the industry. Four firms—Google, Facebook, Baidu and Alibaba—control half of all digital advertising worldwide. Yelp, a firm that hosts online reviews and makes money from local ads, is "one of the most obvious take-out candidates," says Mark Mahaney of RBC Capital Markets, an investment bank.

Yahoo, a darling of the late 1990s internet bubble, is a constant subject of takeover speculation. It is in the process of spinning out its lucrative investment in Alibaba, and is exploring the sale of its stake in Yahoo Japan. After that Yahoo's chief executive, Marissa Mayer, will have run out of tricks to placate investors. Analysts and investors have urged a merger ▸▸

**Awards:** Our deputy editor, Tom Standage, was named "pioneer of the year" at the British Media Awards this week; and our new daily Espresso got a silver in the "app of the year" category.

### Online auction

| Target name | Market value*, $bn | Potential suitors |
|---|---|---|
| Salesforce | 48 | Oracle, IBM, Microsoft, Google |
| PayPal | 45 | Apple, American Express, Alibaba, Google |
| eBay | 35 | Alibaba |
| Twitter | 24 | Google, Tencent |
| Yahoo | 25 | AOL, Comcast, private equity firms |
| AOL | 3 | Yahoo, Comcast, Twitter |
| Yelp | 3 | AOL, Alibaba, Google, Microsoft |
| HomeAway | 3 | Priceline, Expedia |

Sources: Thomson Reuters; *The Economist* *May 6th 2015

**Interactive:** Explore the changing US technology sector at **Economist.com/techfirms**

between Yahoo and AOL, another web portal, to save on costs, but one obstacle is that both Ms Mayer and Tim Armstrong, AOL's boss, want to keep their jobs.

Yahoo, which has billions of dollars in free cash, could also be attractive to a private-equity firm, or to an old-fashioned media firm that wants to strengthen its online-video assets. Comcast, which recently dropped its bid to buy a rival cable company, Time Warner Cable, because of antitrust worries, has cash to spare and will be wondering where else to spend it.

Hunting is easier when you divide a herd. eBay and PayPal, now part of the same company, will split later this year, but how long will they stay independent? eBay's online-auction business has lost users to other shopping websites, such as Amazon. Alibaba, which owns Taobao, a Chinese equivalent to eBay, could find it appealing. PayPal, which facilitates online transactions, could also be attractive to banks and credit-card companies, like American Express, which want to strengthen their position in mobile and online payments.

Some companies will want to expand in areas where they are already strong, the better to fight off other competitors. That may risk the wrath of regulators. "The advantage you have with the internet is that the regulatory regimes are not as aware about the dominance you can create in platforms, and therefore you can create monopolies," says a big investor in internet stocks. Google, which has come under intense scrutiny from European regulators, may beg to differ: it may even be dissuaded from doing any big deals until the political climate improves.

Other firms will want to hedge their bets by investing in new fields unrelated to their core revenue streams. Microsoft, for example, is in the business of selling software, but it is not inconceivable that, if not Salesforce, it could buy LinkedIn, a professional social network. It is cheaper to do this early, however, before the potential of the firm or field is proved. Last year Facebook, an especially active acquirer, bought Oculus VR, a virtual-reality company, for $2 billion. Mark Zuckerberg, Facebook's boss, was not quite sure what he would do with it, but he knew the young firm would become more valuable.

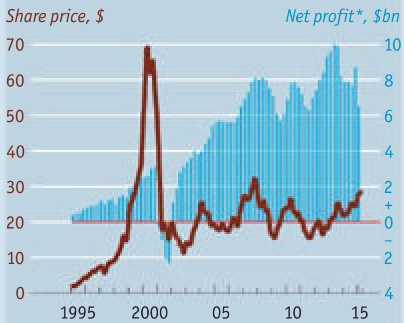
The more mature each bit of the internet business becomes, the more consolidation there will be. Mr Mahaney of RBC points to the online-travel business as an example of what might happen elsewhere, such as among the social networks. The online-travel and booking sector rose in the late 1990s, with many firms fighting it out, but in America it is now dominated by just two big firms, Priceline and Expedia.

Much of the future of dealmaking in Silicon Valley will hinge on valuations, low interest rates and the equity market's health. Some look at Twitter's and LinkedIn's recent falls and wonder whether they are the "tremors before the earthquake", in the words of a venture capitalist. So far the tectonic plates appear to have settled, and investors' worries remain focused on specific companies that have missed targets. However, some still wonder if a big, widespread correction among internet firms is on the way. The industry's cash-rich giants would surely relish this: what better time to strike than when prices have slumped and investors are keen to sell. ■

### Cisco: assessing the Chambers era

After 20 years as CEO, John Chambers is to become Cisco's executive chairman. In the late 1990s dotcom boom Cisco was briefly the world's most valuable listed firm. But its shares did not recover from the ensuing crash, even though profits have grown. Cisco now trades at a price-earnings ratio of 17, cheaper than the NASDAQ's average of 25. In part this reflects big swings in market sentiment. But in part it is because of worries that its expensive networking gear may in future struggle against cheaper rivals'.

Cisco




Source: Bloomberg *Four-quarter moving average

Retailing in India

## Bharti looks to Future

MUMBAI

**In the absence of interest from foreign firms, two Indian grocers team up**

GROCERS often do not travel well. A sally into America in 2007 by Tesco, a then imperious but now troubled British retailer, ended badly. Before that, Walmart had failed in Germany. In India the big international chains have had trouble even crossing the border. A change in the rules in 2012 allowed foreign firms a stake of up to 51% in supermarket ventures. But the ensuing political rumpus led to Indian states being allowed to set tougher rules on their turf. Carrefour of France, having opened only five wholesale outlets, has since decided to leave India altogether. Walmart has withdrawn from a wholesaling joint venture with Bharti Retail, part of a conglomerate whose flagship firm is India's leading mobile-phone operator—though it remains in the cash-and-carry business.

In a less frosty climate, Walmart's tie-up with Bharti Retail might have evolved into a full-blown retailing alliance. Instead the Indian firm, which has yet to make a profit, has had to settle for a local partner. On May 4th it said it would join up with Kishore Biyani, one of India's retail pioneers. Bharti's 200-plus stores, most of them small, will be folded into Future Retail, one of Mr Biyani's three listed enterprises. Future's 370 stores have a higher average floor space and a much greater combined turnover. Bharti's hypermarkets may eventually trade under Future's Big Bazaar banner, but its small supermarkets will keep their Easyday logo. Bharti will get a 9% stake in the combined firm. This will rise to around 15% if the merger meets its initial goals.

An all-share deal probably suits both parties. Mr Biyani keeps his debt under control; the Mittals, the family behind Bharti, keep a stake in retailing that might eventually pay off. It may be a long haul. India's supermarket chains account for just 2% of food and grocery sales. Profits are meagre because revenues have not kept pace with rents. Even rich consumers often prefer the convenience of local *kiranas* (small, family-run shops) to air-conditioned stores with broader ranges. Then again, Indian retailing, like the wider economy, always seems to be on the brink of change. There is reason for optimism. After years in the red, big retailers now cover the cost of running individual stores even if they cannot yet pay for services at headquarters, says Abheek Singhi of the Boston Consulting Group.

In this light the Bharti-Future merger has a seductive logic. The cost of shared

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functions such as marketing, procurement and logistics can be spread across more stores. The combined firm should be able to bargain for better terms from local manufacturers of packaged foods or personal-care products, even if that is not sufficient to harry big global consumer-goods firms into keener prices. And the merger will give Mr Biyani's own-label manufacturing venture (part of Future Consumer Enterprises, a separately listed company that also owns 400 convenience stores) the scale it needs, says Mr Biyani. He believes Future Retail has acquired more than size through the merger. "I am buying a culture and processing and systems," he says, referring to the imprint of Walmart on Bharti. It also has expertise in running small supermarkets, which Future lacks. Such know-how may prove critical. City-dwellers in India have not embraced out-of-town hypermarkets. But smaller, limited-range stores situated closer to home might break their bonds with *kiranas*.

The Bharti-Future merger is India's biggest retailing marriage. More tie-ups are likely, reckons Mr Singhi. India's grocery chains need capital to expand. At one time they might have hoped for a deep-pocketed foreign firm to provide it. But by banding together, they may persuade domestic investors to do so. "If they can show a larger footprint, they can get capital to expand," says Mr Singhi. Smaller outfits with a few dozen stores each might join forces or be picked off by bigger firms. Even if foreign capital is not a big part of the wager, the odds are that India will embrace modern retailing. As countries become richer, they usually do. But as with much else in this complex country, the change will take a lot longer than had first been hoped. ■

Manufacturing in America

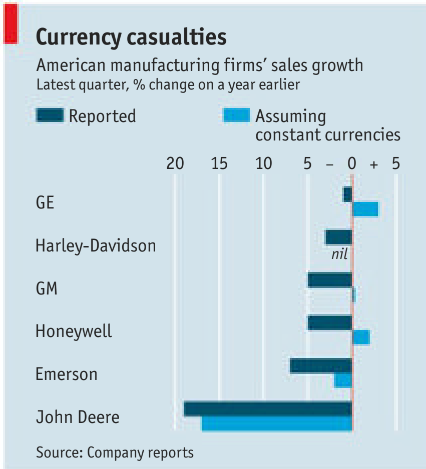
# Uneasy rider

NEW YORK

**The world's toughest motorbike-maker meets a grisly opponent—the dollar**

HAIRY male bikers are hard to spot at the Harley-Davidson dealership in Tribeca, a fashionable part of Manhattan. Half the floorspace is devoted to women's clothes and a café selling delicate pastries. For Harley traditionalists the only consolations are the chrome and leather two-wheelers, and a tattooed attendant who says she moonlights at a heavy-metal bar.

Harley-Davidson used to be the Republican Party of the vehicle industry. Perhaps two-thirds of its customers in America are grizzled white guys. But unlike the GOP it has worked to broaden its appeal, as have the dealers who sell its products in Tribeca




and elsewhere. As well as touring bikes big enough to fit a Jacuzzi on, it now offers zippier models that are easier to ride if you are female—and easier to afford if you are young. So-called sports and street bikes made up a fifth of volumes in 2014. Sales in India, China and Vietnam are booming.

A finer example of an American manufacturer adapting and taking on the world is hard to find. Harley was roaring until last summer. But then it hit something harder and faster than a 1690cc Fat Boy: the dollar. The greenback has soared by 18% since July against a trade-weighted basket of currencies. Currency gyrations affect firms in three ways: by changing the rate at which foreign sales are translated into dollars, by creating financial mismatches and by altering the behaviour of competitors. The impact can be deep, as Harley shows.

Start with the translation impact. In the quarter to March, Harley's sales, in dollars, fell by 3% compared with a year earlier. Had currencies remained flat, sales would have been unchanged. Almost all big American manufacturing firms are in the same boat, although the degree of pain varies according to the size of their foreign arms and the currencies they operate in (see chart). For big American firms overall, as measured by the S&P 500 index, sales fell by 2-3% in the first quarter, the worst decline since the financial crisis in 2009, according to Factset, an analysis firm. The dollar explains much of the slowdown.

Financial mismatches are even more of a headache. The largest American manufacturers have put much of their production closer to their global customers, partly so that their costs and sales are in the same currencies. For example, Emerson, an industrial conglomerate, incurs about 85% of its costs in the same region as the related goods are sold in. But midsized and smaller firms often manufacture mostly in America, even as they sell some of their output abroad. As the dollar rises their costs will stay constant but their sales will fall, squeezing margins. Harley makes most of its bikes in Wisconsin, Missouri and Pennsylvania, whereas a third of its sales are generated abroad. It expects its gross margin to drop in the coming quarter. The foreign business barely broke even in 2014. It may make a loss this year.

The least predictable consequence of big currency moves is how they change the behaviour of competitors. Harley's rivals are mostly European and Japanese firms, which typically manufacture in their home countries. That means they are enjoying soaring revenues and expanding margins thanks to the dollar. Some have decided to blow these new profits by starting a price war in America, with prices dropping by up to 25%. Harley expects to lose market share at home as a result.

What is the right response to all this? Typically, investors want firms to react instantly. In Harley's case the expedient approach would be to cut prices to keep market share. It owns a financing arm and that could water down its lending rules so as to subsidise buyers. As a sop to shareholders, Harley could slash its research-and-development budget and other investment, and launch a much bigger share buy-back programme. Excluding the finance arm, it has no net debt on its balance-sheet.

Harley's new boss, Matt Levatich, accords this approach about the same degree of respect that a Hell's Angel does an Italian scooter. The battle against short-term thinking is something "we will fight every day." Instead he plans to keep on investing, hold prices steady, and weather the storm. Harley's brand and decent record will mean Wall Street grants him some slack. But if a new era of dollar strength has just begun, then eventually Harley will have to think about shifting production abroad—as will other American manufacturers. ■

**Still popular among Republicans**

Theme parks in Europe

# Bumpy rides ahead

PARIS AND SWANSCOMBE

**A surprising investment boom for an industry still not over the last slump**

THE Swanscombe peninsula, a wasteland strewn with rubbish south-east of London (pictured), draws few tourists. But if all goes according to a plan announced on April 27th, by 2020 throngs of them will be coming to visit London Paramount, a film-and-television theme park costing £2.5 billion ($3.8 billion). The theme-park business, which earns annual revenues of $7.5 billion in western Europe, is attracting other new entrants. Last July Cinecittà, an Italian film studio, opened its first theme park near Rome. And a giant theme park and resort with 15,000 hotel rooms, also based on Paramount Pictures' films, is due to open in south-eastern Spain next year.

The developers' enthusiasm is surprising, given the poor performance of Disneyland Paris, Europe's largest theme park. Hit hard by the recession and heavily debt-laden, its owner, Euro Disney, last turned a profit in 2008. In October it had to ask shareholders for a €1 billion ($1.3 billion) cash injection. On May 5th it said its losses had shrunk slightly, to €119m, in the six months to March. Such financial woes can be seen across the industry. PortAventura, near Barcelona, the only Spanish theme park making money, said in November that its profits had fallen year on year by 18% to just €13m.

To balance the books, parks are trying to get visitors to spend more rather than seeking to attract greater numbers. Merlin Entertainments has built new hotels at Legoland and Chessington in Britain, and at Heide Park in Germany. Others are trying to appeal to richer consumers. Last month PortAventura opened its first five-star hotel. Since 2012 Disneyland Paris has spent more than €400m smartening up. Burger joints have been joined by new gourmet restaurants. Euro Disney says it has stepped up efforts to market the resort to wealthy Russians and Arabs, who may pay $10,000 or more to stay in the resort's best hotel suites and enjoy VIP park tours.

According to Euromonitor, a research firm, theme-park visits in Europe have stayed flat since 2011. But its analysts think the strategy of trying to squeeze more out of each visitor will produce returns, and that the industry's revenues will rise twice as fast as footfall over the next three years.

That does not mean it makes sense to build more parks. London Paramount hopes to draw 15m thrill-seekers a year, but Mintel, another research outfit, reckons that all Britain's theme parks together will

Coming soon: a wonderland of dreams

not get more than 17m. The park's developers may be pinning their hopes on the rising numbers of Asian visitors to Britain. But with Paramount, Disney and Legoland all planning new parks in Asia, it is unclear why people would travel so far for something they can enjoy closer to home.

One reason such grand designs are still on the table is state help. The EU has contributed €16m to Paramount's new park in Spain. Russia's government is helping to finance a nationalist-themed park near Moscow. But official handouts are no guarantee of success: 70% of the 2,500 theme parks built in China, many with generous state help, have closed down or are losing money. Their derelict rides and overgrown landscapes should serve as a warning for overambitious developers in Europe. ■

Europe's digital single market

# Disconnected continent

**The EU's digital master-plan is all right as far as it goes**

THE European Union may have removed most barriers to physical trade, but online it remains a prime example of provincialism. Digital businesses still have to deal with 28 sets of national contract laws, adding an estimated €4 billion-8 billion ($4.5 billion-9 billion) a year to their costs. Only 15% of European consumers say they have ever crossed an EU border while shopping online. Only 4% of internet traffic from EU countries goes to online services in another European country, whereas 54% of it goes to services in America.

When Jean-Claude Juncker took over as president of the European Commission, the EU's executive arm, in November, he made a unified digital continent the priority of his mandate, hoping to boost growth by €415 billion annually. More quickly than expected, the commission has delivered, at least on paper. On May 6th it published its "Digital Single Market Strategy".

Much of what the commission proposes in the 20-page document would at least help. It wants to establish common rules for online purchases, integrate telecoms regulations, push postal services to offer better and cheaper parcel delivery across EU borders and reduce the burden on businesses caused by varying VAT regimes. More controversial are the commission's plans to harmonise copyright law, in particular its plan to ban "geo-blocking". Europeans are often barred from accessing online services in another EU country—in some cases because of copyright and other laws, but often for no apparent reason.

Yet the strategy's most problematic section concerns "platforms": the digital services, such as Google and Facebook, on which all sorts of other services can be built, and which have come to dominate the internet. Worried that the mainly American-owned platforms could abuse their market power, the commission says it will launch by the end of this year a "comprehensive assessment" of their role.

France and Germany already seem confident of what the result of this assessment will be. The growing power of some online giants "warrants a policy consultation with the aim of establishing an appropriate general regulatory framework for 'essential digital platforms'," Sigmar Gabriel and Emmanuel Macron, the German and French economics ministers, recently wrote in a joint letter to Andrus Ansip, the commissioner for the digital single market. Aides to Günther Oettinger, another commissioner with digital responsibilities, are said to have already started drafting plans for a powerful new platform regulator.

This may only be a case of France and Germany trying to bully American platform companies into playing nice in Europe—or getting Google to agree to a substantial settlement in the antitrust case that the commission is bringing against it. But the idea that *Plattform-Kapitalismus*, to use an increasingly popular German expression, needs to be reined in has become widespread in the two countries which drive most European policy decisions.

Moreover, says Paul Hofheinz of the Lisbon Council, a think-tank in Brussels, it is unclear how much the strategy will help those firms that are supposed to create most of the new digital jobs: startups. If, of the 32 internet platforms identified by Mr Oettinger's aides, most are American and only one (Spotify, a Swedish music-streaming service) is European, that is mainly because it is harder for new firms on the old continent to scale up rapidly, and thus gain ▸▸

first-mover advantage in a business where that can be vital. To help startups scale up, the commission calls, for instance, for any newly established EU company to be able to expand its operations across borders and become pan-European within a month, completing all the necessary registrations online. However, it is unclear how this aspiration will be fulfilled. "The commission will further elaborate the steps necessary," it says in a footnote.

Being able to establish themselves quickly across the continent is exactly what European entrepreneurs and venture capitalists would like to see happen—according to an unrepresentative survey of a dozen of them by *The Economist*. Also high on their wish list: making it much easier to hire skilled workers from outside the EU, to help them to grow. Most complain not so much about the level of regulation as the fact that it is different in each member state. "I'm now an expert in how to hire people in several countries. I shouldn't be," says Nicolas Brusson, one of the founders of BlaBlaCar, a fast-growing long-distance ridesharing service and one of the few budding technology platforms Europe has.

National and corporate interests usually ensure that much of what is discussed in Brussels goes nowhere (although the document's authors insist that, given Mr Juncker's support, there is no danger of this). That would have good and bad consequences. It would restrain ill-judged plans to swathe internet platforms in red tape. But to judge by previous efforts to create a more unified digital Europe, the sound parts of the commission's strategy would also fall victim to heavy lobbying. Not much survived, for example, of an earlier plan by the commission to create a single market for telecoms services. Proposals to harmonise the allocation of radio spectrum have not got far. Long before the EU has sorted out its digital problems, many more American platforms will have come to dominate its markets. ■


Corporate bribery

# The anti-bribery business

**As the enforcement of laws against corporate bribery increases, there are risks that it may go too far**

EVEN for a company with Walmart's heft, $800m is a sizeable sum. That is what the giant retailer will have spent by the end of this fiscal year on its internal probe into alleged bribing of Mexican officials, into whether subsidiaries elsewhere may have been greasing palms and on related compliance improvements. By the time bribe-busters at America's Department of Justice (DOJ) are done with their own investigation, which began in 2012, Walmart's bill for lawyers' and forensic accountants' fees will be well above $1 billion—and perhaps closer to $2 billion. To that can be added whatever fines it may incur, any bills for settling related private litigation, and the harder-to-quantify cost of the tens of thousands of man-hours managers have spent on what has become a big distraction from everyday business.

The case is not trivial, to be sure. It involves suspicions that bribes were paid to clear the way for construction of dozens of new stores and warehouses, thus helping Walmart to outflank competitors. The case has been widened to include the granting of permits in China, Brazil and India. There should be no complaint that such cases are being scrutinised closely: the corrosive effects of bribery, in eroding trust in government and dampening innovation, are well documented. Nevertheless, some see the expensive and time-consuming Walmart case as part of a mounting body of evidence that the war on commercial bribery is being waged with excessive vigour, forcing companies to be overcautious in policing themselves. Some of those under investigation are starting to push back.

Until a decade ago, giving bribes to win business or speed up transactions was widely seen as a necessary evil, especially in emerging markets. In parts of Europe, companies were even allowed to deduct kickbacks they had paid against tax. But anti-bribery enforcement has been transformed since the early 2000s, when NGOs started to raise a stink and America stepped up use of its Foreign Corrupt Practices Act (FCPA).

This law was passed in 1977, but in its first quarter-century it was largely ignored by prosecutors. As recently as 2007, the largest fine under the FCPA was less than $50m. Now the worst offenders pay 10-15 times that. Foreign firms, if they have a presence in America, can also be caught in its prosecutors' net. Alstom, a French industrial group, paid up $772m last year in the largest FCPA criminal penalty to date, after allegations it had spent $75m on bribes in countries including Egypt and Indonesia. 2014 was a record year for FCPA penalties (see chart 1, next page). This year is shaping up to be busy too, as new fronts are opened up to probe, for instance, the hiring by banks of "princelings" (relatives of important Chinese officials).

Though America remains the toughest enforcer, in the past few years other countries have started to flex their muscles (see chart 2, next page). This second group includes Germany, South Korea and Britain, which consolidated and improved upon a hotch-potch of previous legislation with its Bribery Act of 2010. Brazil has passed a new law and is using it to go after firms caught up in the Petrobras scandal. China's anti-corruption drive under Xi Jinping has ensnared GSK, a British drugmaker. It was found guilty last year of using travel agencies to create bribery slush funds and fined $490m—though local managers got away with suspended sentences because the company showed remorse.

Enforcement remains patchy. In much of Africa, relevant laws (if they even exist) are unenforced. Around half of the 41 signatories to the OECD's anti-bribery convention have yet to impose any sanctions. But there is no doubt about the direction of change. As the chance of wrongdoing being detected grows, so does the chance of the investigation being "messy and multi-jurisdictional", with several countries looking for redress, says Crispin Rapinet of Hogan Lovells, a law firm.

The costs can keep coming in after a company has paid for an investigation and a settlement to prosecutors. Increasingly, firms are required to bear the cost of being overseen for several years by an independent compliance monitor. Firms that have recently been involved in bribery investigations may also be excluded from procurement processes, may suffer a higher cost of capital (large fines can trigger credit-rating and loan-facility reviews), and be hit by shareholder lawsuits.

Siemens, a German industrial group, has spent more than $3 billion on bribery-related fines and costs since 2008. Its compliance department has ballooned from a handful of people to more than 400. Avon, an American cosmetics company caught bribing in China, spent nearly $350m on a variety of legal and compliance fees, more than double the penalties it incurred, and not far short of its 2014 operating profit. At worst, the overall financial consequences can be more than ten times the settlement a firm agrees to pay prosecutors, calculates Mike Koehler of Southern Illinois University, who writes the "FCPA Professor" blog.

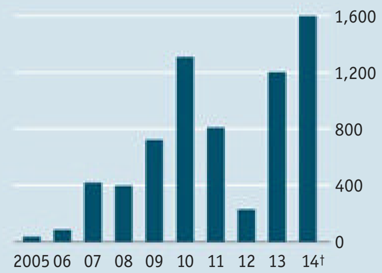
The huge amount of work generated for internal and external lawyers and for compliance staff is the result of firms bending over backwards to be co-operative, in the hope of negotiating reduced penalties. Some are even prepared to waive the statute of limitations for the conclusion of their cases. They want to be sure they have answered the "Where else?" question: where in the world might the firm have been engaging in similar practices?

In doing so, businesses are egged on by what Mr Koehler calls "FCPA Inc". This is "a very aggressively marketed area of the law," he says, "with no shortage of advisers financially incentivised to tell you the sky is falling in." Convinced that it is, the bosses of accused companies will then agree to any measure, however excessive, to demonstrate that they have comprehensively answered the "Where else?" question. So much so that even some law enforcers have started telling them to calm down. Last year Leslie Caldwell, head of the DOJ's criminal division, said internal investigations were sometimes needlessly broad and costly, delaying resolution of matters. "We do not expect companies to aimlessly boil the ocean," she said.

Her words have provided scant comfort: defence lawyers say that their clients feel that if they investigate problems less exhaustively, they risk giving the impression that they are withholding information. Some say the DOJ is maddeningly ambiguous, encouraging firms to overreact when allegations surface. It does not help that it has cut its staff-training on how to run such complex cases.

**Kicking back against kickbacks** 1

Bribery fines imposed*




Source: OECD *Signatories of OECD anti-bribery convention †US only

Partly as a result of this, and partly because bribery schemes are growing more sophisticated as law enforcers up their game, cases are taking much longer to resolve than they used to. Big ongoing cases, such as those of Alstom and Walmart, may stretch for up to ten years; in contrast, that of Siemens, the giant case of the past decade, took under three. In a recent article Paul Pelletier, formerly a senior prosecutor, argued that the DOJ's processing of cases has become so drawn out that it now oversees a bribery "sinkhole".

Others worry that the America-centred model that has emerged for resolving international bribery cases fails to deliver justice. More than four-fifths of FCPA cases against companies since 2010 have been settled with deferred-prosecution or non-prosecution agreements—that is, out-of-court settlements in which the prosecution's case does not undergo the scrutiny of a judge. In the law's 38 years, only one case against a public company has gone to trial. When settlements are announced, there is often sparse detail, and thus little on which to build a body of case law.

Surely companies with a strong defence would refuse to roll over and settle? Not necessarily. Even those that do have a good case are scared to fight and risk a criminal indictment that would clobber their share price. It is commercially rational to roll over, all the more so given how severely any failure to co-operate is punished. Ask Marubeni of Japan, whose coyness towards the DOJ led to its being forced to plead guilty and pay an elevated fine. This hands prosecutors a lot of discretion. "The FCPA often means what enforcement agencies say it means," says Mr Koehler. "We have only a façade of enforcement." That matters all the more since other countries are copying the American approach: Britain, for instance, has allowed deferred-prosecution agreements since 2013.

Some companies are starting to resist prosecutors' expansive legal interpretations. Wall Street bankers have recently locked horns with government agencies over their reading of the FCPA's stance on hiring relatives of senior officials in China. The moneymen dispute the claim that hiring someone with the intent of winning business could itself be illegal.

In the few cases where matters do reach court, the results are mixed. Last year a federal court approved the DOJ's broad definition of "foreign official", to include some managers at partly state-owned firms. However, another court dismissed an indictment against two Ukrainians, in a case in which the only American link was the tangential involvement of a federal agency. The judge said he had never seen a more misguided prosecution, and accused the DOJ of foolishly trying to play bribery policeman to the world. In 2013 Britain's Serious Fraud Office suffered several embarrassing setbacks in court, including the collapse of a case against Victor Dahdaleh, a billionaire who had been charged with paying bribes to Bahraini officials on behalf of Alcoa, an American firm.

Such occasional defeats show that bribery cases, which rely on tracking international paper and money trails, can still be hard to build. But more countries are trying, which means that firms under investigation will increasingly find themselves pursued from several directions.

Different countries will not necessarily take each other's penalties into account. Even allies like America and Britain are not beyond conducting duplicative probes, as Alstom can attest. Nathaniel Edmonds, a former government FCPA lawyer now with Paul Hastings, a law firm, does not think enforcement has gone too far. But he accepts that it can be "extraordinarily difficult [for firms] when numerous governments are involved, with sometimes competing interests." Klaus Moosmayer, chief compliance officer of Siemens, says the lack of co-ordination in cross-border investigations is "a huge challenge" for business. "The largest multinationals will always have the occasional case of suspected bribery. They need reassurance that if they disclose it they won't be punished twice." ■

**Ganging up on graft** 2

Number of foreign bribery schemes sanctioned*
1999-2013


Source: OECD *Under each country's laws

# Schumpeter | The Piggly Wiggly way

**Businesses should think carefully about continuing to heap work on their customers**


IN 1916 Clarence Saunders changed the face of retailing when he opened his first Piggly Wiggly supermarket in Memphis, Tennessee. Hitherto, shops had kept all their goods behind the counter: customers told the staff what they wanted, waited while their purchases were bagged up, then handed over their money. Saunders came up with the idea of self-service. Customers selected their own groceries from the shelves, and took their baskets to a cashier on the way out. Saunders proclaimed that by cutting labour costs his idea would "slay the demon of high prices".

At its height, in 1932, the Piggly Wiggly empire had 2,660 stores. Saunders had lost control of the company in the 1920s but he kept innovating, seeking to perfect the fully automated shop. This included working on a "shopping brain", which shoppers would use to keep a tally of their bills. As a business Piggly Wiggly is now a shadow of its former self: it has only about 600 stores in 17 American states. But as an idea it has conquered the world.

The self-service revolution rolls on to this day. CVS, an American pharmacy chain, has replaced cashiers with self-service pay-points. Waitrose, a British grocery chain, offers customers a modern-day version of Saunders's shopping brain, to scan and tot up their purchases. Banks are making it ever easier to do transactions online, while cutting their branches. Following a model pioneered in America by such firms as Avon and Tupperware, Unilever and other consumer-goods giants are seeking to convert some of their emerging-market customers into freelance salesfolk, who peddle their products to friends and neighbours.

The travel industry has been particularly ruthless in engineering its own staff out of its business. You book your trip using a price-comparison app on your smartphone. You print your boarding passes before setting out. At the airport you scan them, and your passport, at a machine. Some airlines now expect you to weigh and tag your own luggage, and haul it on to the conveyor. At your hotel, there may be no check-in staff, let alone porters: Omena hotels, a Scandinavian hotel chain, sends its customers PIN codes which they can use to open their doors. Soon, a wave of the Apple Watch on your wrist will be all it takes.

The variety of businesses touched by the self-service revolution is ever greater. Threadless, a group of clothes designers, invites customers to submit their own patterns and to vote on which ones should go into production. Tech companies turn their most knowledgeable customers into unpaid troubleshooters by encouraging them to participate in "user forums", where they solve others' technical problems. The *Huffington Post*, an online newspaper, gets its readers to write as unpaid columnists. GE is working towards a world in which it no longer has to keep a stock of spare parts for its jet engines: customers will download digital designs of the parts, and make them on their own 3D printers.

This is all wonderful for businesses. But what about their customers? In a new book, "Shadow Work", Craig Lambert presents a dystopian vision of the self-service revolution. The reason why so many people feel overworked these days is that they are constantly being asked to do "unseen" jobs by everybody from Amazon to the Internal Revenue Service to the local school board. And the reason why they feel so alienated is that they spend so much time pressing buttons and speaking to machines rather than interacting with other people.

Mr Lambert is perhaps too gloomy. The self-service revolution is partly driven by customers' own preferences: it is quicker to choose your own groceries than to wait for someone to do it for you; it is easier to print your boarding passes at home than queue at the check-in counter. And customers can fight back: complaints about automated telephone services have forced some companies to revert to having people answer the phone. Many people are now refusing to drive to out-of-town, self-service supermarkets, choosing instead to have their shopping delivered.

But he is right about the enervating cumulative effect of all the instances where personal service has been replaced with self-service. Being able to do one or two things for yourself can feel liberating; having to do everything can make you feel like a slave to the machine. And the trend is far from over. Some bars are trying out a technology called iPourIt, in which drinkers have to wear a wireless wristband that monitors how much booze they are serving themselves from the taps. Before long, no doubt, self-service barbershops will invite customers to pop their heads into a clipping machine and turn a dial to select the severity of the cut.

**The pampered and the paupers**

The rise and rise of the self-service business raises two worries in particular. The first is for society as a whole. Even as they eliminate the personal touch from their mass-market offerings, service industries keep chasing the well-heeled with extravagant, premium-priced offerings. Consumers are being ever more clearly divided into a "cattle class", herded into the back of the cabin and offered precious little service, and a pampered "business class", for whom no amount of fawning is too much. (Fly Virgin Atlantic in its ironically titled Upper Class and you get a private car to take you to and from the airports, and flunkeys waiting in the lounge to polish your shoes and cut your hair.) Not only might this intensify resentment of the haves by the have-nots; it also robs the have-nots of entry-level jobs.

The second worry is for businesses themselves. If they never meet their customers, they will lose touch with them. And although self-service is great for saving costs, its effect over time is to train customers to shop on price, and thus to switch as soon as a slightly cheaper rival comes along. If firms abandon trying to differentiate themselves with good service, they are making themselves vulnerable to the sort of attack Britain's mainstream supermarkets are now suffering from an invasion of German discounters. That's where the Piggly Wiggly way leads. ■

Also in this section



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Indonesia's economy

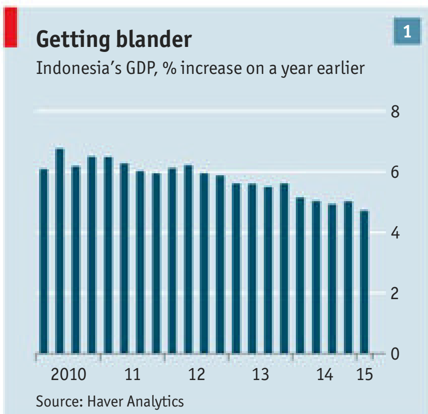
# Spicing up growth

JAKARTA

**Bad policy as much as bad infrastructure is holding Indonesia back**

IN LATE April Indonesia's president, Joko Widodo, better known as Jokowi, wooed foreign moneymen at a big international conference. Investing in Indonesia will bring "incredible profits", he promised. "And if you have any problems, call me." Two days later, at a summit of Asian and African dignitaries, Jokowi struck a different note. He called for "a new global economic order that is open to new emerging economic powers" to avoid the "domination of certain groups and countries".

That is not necessarily a contradiction: you can pursue foreign cash while also arguing that international financial institutions grant developing countries too little power. But the change in tone was striking: from open, affable and welcoming of foreign money to prickly and suspicious of it.



Source: Haver Analytics

In his first seven months as president, Jokowi has tended to present the first face to the world, particularly to potential investors. But Indonesia's policies still show too much of the second. That has grave implications for the country's future.

Jokowi (pictured) says he wants Indonesia to return to 7% annual growth—a rate unseen since the Asian financial crisis of the late 1990s, but not unusual before it. In fact, the economy is slowing. In the first quarter of this year it grew by 4.7% year on year, down from 5% in the previous quarter (see chart 1). On a quarterly basis, it has been shrinking for six months now.

The problem is commodities. Ever since the ancient Romans acquired a taste for cloves, commodities have played a big part in Indonesia's economy. The country is the world's leading exporter of palm oil and tin, the second-biggest rubber exporter and the fourth-largest coal producer. The Grasberg mine in Papua, Indonesia's biggest and easternmost province, is the world's biggest gold mine and its third-largest copper mine. When China's hunger for commodities was growing and prices were high, Indonesia boomed. But since 2011 its growth rate has declined, reflecting China's weakening appetite for raw materials and the dramatic fall in prices this has precipitated.

Jokowi's plan is to rebalance Indonesia's economy away from commodities and towards manufacturing. The country managed a similar shift once before: in the late 1970s and 1980s, as the price for Indonesia's then-abundant oil fell, the government tried to attract foreign investment in industries like food processing and carmaking instead.

By 1990 manufacturing's share of GDP exceeded that of agriculture for the first time, thanks to a winning combination of low wages, decent infrastructure, a stable investment climate and abundant natural resources (see chart 2). That boom ended with the Asian financial crisis and the chaotic fall of Suharto, Indonesia's long-serving strongman, in the late 1990s.

Indonesia today should be even more attractive as a manufacturing hub. It is the fourth-most-populous country in the world, with a huge, fast-urbanising domestic market and a rising consumer class. Workers are cheap: the average manufacturing job pays a base salary of $253 per month, compared with $369 in Thailand and $403 in China. Demography is in its favour: its median age, 29.2, is well below those of Thailand (36.2) and China (36.7).

But Indonesia's bureaucracy is impenetrable and its infrastructure, much neglected since Suharto's day, woeful. Companies spend 50% more on logistics than those in ▸▸

Source: World Bank

Thailand and twice as much as those in Malaysia. No wonder that foreign investment has stagnated in recent years. Manufacturing's share of GDP, meanwhile, fell from 29% in 2001 to 24% in 2013.

Jokowi has taken some steps to reverse this slide. He launched a one-stop shop for investment approvals in January that has helped speed progress through Indonesia's Kafkaesque bureaucracy (though when dealing with Indonesian bureaucracy, "speed" is a relative concept: according to Wellian Wiranto of OCBC, a Singaporean bank, the one-stop shop has reduced the number of days required to obtain a permit to build a power plant from 923 to 256).

Using savings from the welcome cutting of fuel subsidies late last year, Jokowi has boosted the budget for infrastructure by 53%—the biggest year-on-year increase in Indonesia's history. Better roads and ports should drive down logistics costs. Some of the money is for much-needed power plants: Indonesia has five times Britain's population, but just half of its generating capacity. He has also sought out foreign investment for infrastructure projects.

But many businesspeople worry that the results will not match the rhetoric. Much of Jokowi's infrastructure money will go to inefficient, state-owned enterprises. Indonesia has inflexible labour laws and minimum wages have shot up (albeit from a low base). Moreover, a morass of protectionist rules persists. The number of industries barred to foreign investors, for instance, has grown steadily. Last year the "negative-investment list" expanded to include onshore oil extraction and e-commerce. In 2014 the government banned the export of some raw minerals in

## Buttonwood | More Kirk than Spock

**Behavioural economics has made headway, but still has a long way to go**

CAB drivers have good days and bad days, depending on the weather or special events such as a convention. If they were rational, they would work hardest on the good days (to maximise their take) but give up early when fares are few and far between. In fact, they do the opposite. It seems they have a mental target for their desired daily income and they work long enough to reach it, even though that means working longer on slow days and going home early when fares are plentiful.


Human beings are not always logical. We treat windfall gains differently from our monthly salary. We value things that we already own more highly than equivalent things we could easily buy. Our responses to questions depends very much on how the issue is framed: we think surcharges on credit-card payments are unfair, but believe a discount for paying with cash is reasonable.

None of these foibles will be a surprise to, well, humans. But they are not allowed for in many macroeconomic models, which tend to assume people actually come from the planet Vulcan, all coolly maximising their utility at every stage. Over the past 30-40 years, in contrast, behavioural economists have explored the way that individuals actually make decisions, and have concluded that we are more Kirk than Spock.

In his new book "Misbehaving: The Making of Behavioural Economics", Richard Thaler describes his struggles to persuade mainstream economists of all this. The results of behavioural research were at first dismissed as trivial, or the consequences of unrealistic laboratory experiments. It was argued that in the real world, ordinary people might not always think straight but that the professionals who make the big decisions would. Mr Thaler shows neatly, however, that the coaches and owners of professional American football teams, for instance, make consistent errors in the yearly "draft" to pick new players, placing far too much emphasis on their first choices.

Asking people how they actually behave has been seen as a bit lowbrow. As Mr Thaler writes: "To this day, the phrase 'survey evidence' is rarely heard in economic circles without the necessary adjective 'mere', which rhymes with sneer." Milton Friedman, an economist, argued that a theory should not be judged on the realism of its assumptions, but rather on the accuracy of its predictions.

In a lovely passage, Mr Thaler recounts his attempts to explain the prevailing economic theory on savings to a room full of psychologists. "The psychologists remained stunned in disbelief," he writes, "wondering how their economics-department colleagues could have such wacky views of human behaviour."

Politicians, however, did take notice. The British government, for one, set up a behavioural-insights team to make policy more effective. It is now accepted that the way choices are offered does affect decisions, such as asking people to opt out of, rather than into, pension schemes or organ donation. The effect on take-up is substantial, which should not be the case if individuals were perfectly rational.

This "nudge" approach works elsewhere. Fixing parking tickets to car windows with bright orange stickers (rather than a piece of paper under the windscreen-wiper) attracts the attention of passing cars and makes drivers less inclined to park illegally, because the risk of being caught seems higher. Writing to delinquent taxpayers and telling them that most fellow-citizens have paid up makes them more likely to cough up, too.

At the microeconomic level (the actions of firms and individuals), the behavioural school is now well-established. Mr Thaler is president of the American Economic Association this year and his successor, Robert Shiller, is another behaviouralist. But the school has struggled to make progress in the field of macroeconomics (the behaviour of the whole economy). Rather like the division between quantum physics and classical physics, it is not clear that it can be reconciled with mainstream theory. As Mr Thaler writes of behavioural theories, they "do not make easily falsifiable predictions and the data are relatively scarce". It is hard to run lab-style experiments on whole economies: how can you have a control?

Surely, however, given the failure of most economists to predict the financial crisis, an attempt should be made to incorporate behavioural insights at the macro level. Mr Thaler has one suggestion: give people tax rebates in increments, rather than one-off payments, and they are more likely to spend them than save them. It is a modest start but, for bright young economists, this field is the way to go.

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a disastrous effort to ramp up domestic smelting; exports of bauxite collapsed from 55m to 500,000 tonnes within a year, without any concomitant rise in alumina or aluminium exports.

Local-content laws abound, covering energy, retailing and carmaking, among other sectors. A long-mulled, much-criticised draft law may soon require companies that sell tablets and smartphones to produce up to 40% of their components in Indonesia. The aim is to boost domestic tech manufacturing; instead, it will probably create a flourishing black market for iPhones and scare off potential investors. Tight immigration rules have cut the number of foreign workers in Indonesia by 16% in three years, to just 64,000 in 2014. Foreign doctors are banned; foreign oil-and-gas workers must be below the age of 55.

Much of this is not Jokowi's doing. Economic liberalism has never really taken hold in Indonesia. Its parliament is always ready to embrace protectionist policies, driven by the widespread belief that foreigners have long plundered Indonesia's resources and left locals none the wealthier. The Asian financial crisis left Indonesia deeply suspicious of foreign capital.

Nor is Jokowi blameless. A decree published without consultation in January unexpectedly banned the sale of beer in minimarts and other small shops across the country, depriving brewers of perhaps half their revenues and startling investors who now fear more surprise regulations. He promised to increase government revenues by bringing more Indonesians into the tax system, but many foreign firms whisper that tax officials are squeezing them harder instead.

Carmaking, led by Japanese firms, is humming along: production is now rising in Indonesia and falling in Thailand. For the past two years more cars have been sold in Indonesia than in any other country in South-East Asia. But Jokowi has lately promoted the potential for a national-car scheme in partnership with Proton, the money-pit that is Malaysia's national carmaker. Jokowi's supporters say he has the right ideas, and stress that he faces strong opposition. But whether bad policies are enacted with Jokowi's support or because he is powerless to stop them matters little: either way, they hinder investment that Indonesia sorely needs.

Geography already puts Indonesia at a disadvantage: it sprawls across more than 13,000 islands, which means that getting goods from one place to another will always be more complicated (and expensive) than just putting them on a lorry. But that makes good policy all the more crucial. When commodities were in demand, Indonesia's business environment mattered less: companies that wanted tin and copper had to go wherever they could be found. Manufacturers can be choosier. ■

Saudi Arabia's stockmarket

# A cautious opening

**Foreigners will be allowed to buy shares next month—within limits**

INVESTORS have long looked hungrily at Saudi Arabia. With a GDP of $750 billion, it is the Middle East's biggest economy, but also its most closed. Its stockmarket, Tadawul, has a market capitalisation of $590 billion, but foreigners can invest only indirectly, using derivatives sold by Saudi intermediaries. There was great excitement last year when the government announced that it would open the stockmarket to foreign investment on June 15th. But the rules it laid out this week governing such investments are cautious, to say the least.

Foreign investors must manage $5 billion in assets to gain entry. No more than 49% of a company can belong to foreigners, and no more than 5% to an individual foreign investor. Total foreign investment in the bourse cannot exceed 10% of its value. The restrictions are similar to those China imposed when first allowing foreign money onto its exchange.

Western investors are always looking for new "frontier" markets, and big asset managers such as BlackRock and Franklin Templeton have welcomed the chance to enter another. There is little need to worry about currency movements, since the riyal is pegged to the dollar. Better yet, the market has risen by 19% this year.

That performance is all the more remarkable given the slump in the price of oil, which dominates the Saudi economy and accounts for 90% of government revenues. Saudi stocks are less affected by the oil price than those of other Gulf countries. Some companies, including petrochemicals firms, do better when their main input becomes cheaper. More important, the government has not cut social spending despite its slumping income, but has drawn down its foreign investments instead. That is unlikely to change soon.

There are still plenty of risks. The market is volatile, although foreign investment may help to dampen that. Reforms are needed, not least to prevent big local investors from manipulating the market. Much of the gain in share prices this year has come in anticipation of a rush of foreign investment, not thanks to improved prospects for local firms. And the government's assets are not limitless: if the oil price remains subdued, it will eventually have to curb spending, to the economy's harm.

Foreign capital could help bolster the economy against that day. It could also help raise managerial standards at Saudi companies. "Family-owned businesses in particular are short on transparency and good governance," says Fawaz Hamad al-Fawaz, a Saudi economist. Indeed, plenty hope that the stockmarket reforms portend a broader opening-up. Many of the younger generation of princes who are now rising to power have been pushing for economic liberalisation. Officials have indicated that they may loosen the rules further over time. But little in Saudi Arabia happens quickly. ■

Bond markets

# Reverse speed

**Bond yields are suddenly rising**

RARELY can a market have changed direction with such speed. For most of 2015 European government-bond yields had been heading lower, with the German ten-year yield on a seemingly inexorable path towards zero. Shorter-term German bonds were already offering negative rates, meaning that investors who held the debt to maturity were bound to lose money.

Then, in the middle of April, the markets turned and yields started rising again (which means that bond prices fell). Germany's ten-year yield is now back where it was at the start of the year. The sell-off has driven yields in the rest of Europe higher as well (see chart).

Higher bond yields would be good news if they were prompted by a sudden improvement in economic data. That might make investors more confident about owning equities, and less keen on the safety of government bonds. But there has been no great pick-up in the economic outlook of late. Analysts at Royal Bank of Canada have thus dubbed this "the wrong kind of sell-off".

The reversal seems to be the result of a number of interconnected factors. At the start of 2015, yields were falling because of fears of deflation (linked to a plunge in the price of oil in the latter half of 2014) and because investors were anticipating massive demand for bonds from the European Central Bank as it began its quantitative-easing (QE) scheme in March. The prospect of QE also caused the euro to fall against the dollar. With the euro falling and European bond prices rising, international investors may well have borrowed euros to buy European government bonds. An alternative strategy, known as the "carry trade", saw investors borrow euros at low rates and put the money into higher-yielding assets such as equities to benefit from the spread, or carry, between the two.

Over the past month, many elements of those trades have turned sour. The oil price has rebounded, reducing the likelihood of outright deflation and thus relieving some of the pressure on bond yields. Talks between the European Union, the IMF and Greece have faltered, causing investors to lose some of their enthusiasm for European equities. Weak growth in America in the first quarter, analysts assume, will lead the Federal Reserve to put off raising interest rates; that has undone some of the dollar's gains against the euro. As a result, investors have unwound their carry trades, buying back the euros they borrowed and selling the risky assets they bought.

The big question is whether the very long bull market in government bonds is over. The yield on ten-year Treasury bonds has also risen sharply in recent months, from 1.64% at the end of January to 2.2% on May 6th. Before the financial crisis, the last time bond yields were that low was in 1950; over the subsequent 30 years, bonds lost seven-eighths of their value in real (ie, after-inflation) terms.

**Yield of screams**

Ten-year government-bond yields, %


Source: Thomson Reuters

As yet, however, there is no sign of inflation; American prices have been flat over the past 12 months. When the Federal Reserve hinted at winding down its QE programme last year, a big sell-off in bonds, dubbed the "taper tantrum", ensued—but it soon reversed.

Bears have been calling for a collapse in Japanese government-bond prices ever since the yield first fell below 1% in 1998. Although the Japanese government has piled up debt since then, a combination of an ageing population and deflation has kept yields low. The bearish trade on Japanese government bonds has since become known as "the widowmaker". That alone ought to prompt investor caution about making the same bet against government bonds in Europe and America. ■

Investor-state dispute settlement

# Playing nicely

PARIS

**Europe suggests ways to protect governments from investors**

LINKING America and the European Union in the world's largest free-trade area could, according to an independent study for the European Commission, add more than €200 billion ($224 billion) to economic output on both sides of the Atlantic. In the overall scheme of things, therefore, one of the biggest obstacles to the Transatlantic Trade and Investment Partnership (TTIP) seems a smallish detail: agreeing on what legal redress a foreign investor should have when it thinks a host country is pulling the rug from under it. Yet activists on the two sides of the Atlantic have made investor-state dispute settlement (ISDS), as it is known, the centrepiece of their opposition to TTIP and other free-trade deals.

America wants investing firms to have the right to haul states off to binding arbitration. This is not so outlandish: some form of ISDS features in most of the world's 3,000 or so bilateral trade and investment treaties, including two the commission agreed to last year. But European politicians have delayed those. They are disinclined to let foreign profit-seekers challenge national regulations on public health, food safety, environmental standards and the like before private tribunals manned by corporate lawyers.

In fact, more than half of such cases are heard at a centre run by the World Bank. But the number of investor-state disputes is rising. Among the cautionary examples often cited are the suit brought by Vattenfall, a Swedish energy firm, against the German government for phasing out nuclear power after the Fukushima disaster and that of Veolia, a French utility, against the Egyptian government for raising the minimum wage.

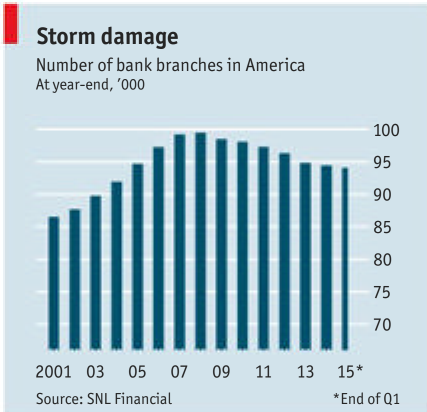
The controversy led the commission to suspend talks with America on investor protection last year. Now it has come up with a proposal that could lead to their resumption. On May 5th Cecilia Malmström, Europe's trade commissioner, revealed rules that she thinks will encourage and protect foreign investment without infringing the right of governments to pursue their public-policy priorities. TTIP and other free-trade deals, she suggests, should state explicitly that investment-protection rules cannot be used to undermine states' right to regulate, merely to ensure fair repayment if investors are treated arbitrarily. ISDS arbitration systems should become more like conventional courts, with greater public access, permanent arbitrators as well qualified as judges, and an appeals procedure. The European Union would also work to establish an international investment court to replace bilateral schemes.

If Ms Malmström's fellow ministers and Europe's legislators agree, these ideas will form the basis of renewed negotiations with the Americans. They may also help mollify Congress, which has been increasingly hostile to TTIP of late.

Retail banking

# The great pruning

**Banks are thinning their branch networks. More drastic cuts may come**




"WHY can't I just talk to somebody?" screams an exasperated customer in a 1980s advertisement for Barclays, a British bank. In the dystopian future it depicted, banking is entirely automated. A computer-generated face on a screen is denying all requests for a loan—until the customer smashes it. The camera then cuts to an image of a smiling Barclays adviser sitting in a busy suburban branch, eager to help. "Do you worry the more banks become automated, the more you'll become just a number?" a kindly voice asks.

Thirty years on, the vision the admen fretted about is coming to pass, while branches of the sort presented as the solution are largely empty. Customers, it seems, are perfectly happy dealing with machines—often their mobile phones—to check their balances or make a payment. Barclays has even embraced video banking: in what it called "a watershed moment", it recently launched a round-the-clock service that allows clients to speak to advisers on a screen.

For years branch numbers in rich countries have been on a downward path, a trend that shows no signs of abating. In America there are 1,441 fewer branches today than a year ago, and 5,439 fewer than at the peak reached in 2008 (see chart). Banks long seen as brick-and-mortar enthusiasts, such as JPMorgan Chase, have announced retrenchment plans. The decline has been even quicker in the euro zone, which has roughly 160,000 branches, many more than America despite a similar population.

The rise of ATMs, telephone banking, the internet and now smartphones has led to declines of 5-8% a year in the number of visits to branches, according to Ian Walsh at the Boston Consulting Group. That is the sort of slump that pushed high-street video-rental outfits into oblivion. Worse, many of the services once delivered in branches, such as international transfers or personal loans, are now being offered by nimble "financial technology" groups (see this week's special report). That has dented revenue even while costs remain stubbornly high.

A handful of "challenger" banks with online-only offerings are popping up, too. The newcomers have yet to take much market share, but that may change. At the moment low interest rates leave no bank in a position to pay very much interest on deposits. But when rates start to rise, those that do not have expensive branches should be able to offer higher deposit rates to lure customers.

Branches still have their uses. Older customers, a wealthy and profitable slice of the population, like them. Shops use them to deposit the contents of their tills, insofar as their clients still pay with cash. And politicians berate banks that close branches, particularly in rural areas.

Moreover, argue branches' defenders, although day-to-day transactions are largely done online nowadays, customers typically still want to come in to discuss more fiddly matters, such as obtaining a mortgage or buying investment products. "There are key touchpoints in your financial life where you want to connect with a person," says John Flint, head of retail banking at HSBC. Whereas transactions using tellers are expensive for banks—each costs $4 or so, versus 4 cents for its online equivalent—arranging loans and the like is a potential source of revenue.

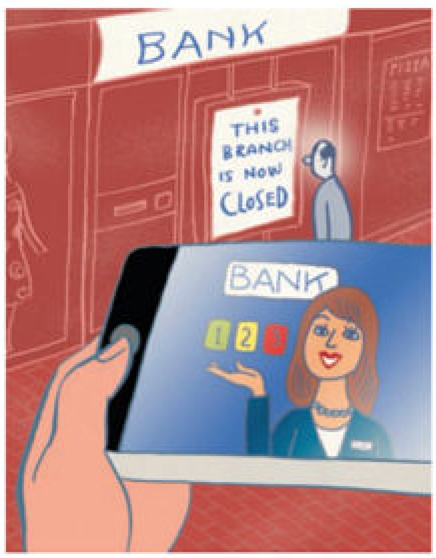
Banks are thus adapting their branches to do less transacting and more selling. Each refurbishment inevitably results in fewer tellers and more meeting rooms where staff can pitch products. Employees armed with iPads dissuade customers from waiting for tellers, pushing them instead to souped-up ATMs to deposit cheques, for example, or prodding them to download an app to do the same thing via a smartphone. CaixaBank, a big Spanish lender, has taken the next step, sending iPad-wielding salesmen out of the branch altogether, to call on clients at their offices.

Uniform branch formats are being replaced by a range of set-ups, from large flagship "stores" to poky ones with just a couple of desks. Some banks are opening branches in less prominent and cheaper spots. Others are trimming business hours, or staying shut on entire workdays, to save on labour. The aim is to cut the expense of renting and staffing branches from something like 60% of the total cost of running a retail bank to 40%.

Such incrementalism may be insufficient, however. Bank bosses worry that their phone-addicted children have never been inside a branch. That is not surprising: they are the fastest adopters of new technology, and are too young to have mortgages or need investment advice. Whether they will start visiting branches when they get to the "key touchpoints" in their financial lives is the big unknown. Many think not: mortgages and loans can be obtained online now.

Yet even if some branches now have more staff than customers for much of the day, a visible high-street network serves to reassure those who equate physical presence with financial soundness. Some 30-40% of bank clients almost never set foot in one, according to Novantas, a consultancy, yet still stick with the high-street chains. "Twenty years ago, the branch was the bank," says Kevin Travis of Novantas. No longer. People have gone from being branch-dependent to being merely psychologically attached to them, he argues.

That is a thin premise to justify billions of dollars of cost. After a few good experiences with a call-centre or the video systems all banks are starting to offer, previously hidebound customers may stop caring whether their local branch survives. The most likely outcome is much thinner foliage: if two-thirds of America's branches closed, it would still have more per person than Norway. Customers who crave reassurance can be comforted with a handful of flagship branches they might visit once a decade, if that. Many bankers hope to imitate Apple, which sells its gizmos online with the help of a few ambassadorial showrooms. Pass the secateurs. ■



# Free exchange | Money for old folk

**The relationship between ageing and inflation is not as simple as economists assume**

WHEN it comes to the economic impact of demography, Japan is the wizened canary in the world's coal mine. It has become older faster than any other big country: its median age went from 34 in 1980 to 46 today, and will continue rising for decades. But it will soon have plenty of greying company, from wealthy countries such as Finland and South Korea to developing giants, including China and Russia. Economists generally agree that the ageing of populations leads to slower growth, because a country's potential output tends to fall as its labour force shrinks. They also expect heavier fiscal burdens, with governments providing for more pensioners from a smaller tax base.

Until recently, though, there had been little research into how demography affects inflation. The Japanese example of persistent deflation over the past two decades was seen as evidence enough that prices fall when countries age and their growth slows. Shinzo Abe, Japan's prime minister, has sought to disprove that, espousing massive monetary easing to get prices rising. With inflation slumping far below the Bank of Japan's 2% target in recent months, it is tempting to conclude that ageing is too powerful a force to overturn. But a new body of research* gives advocates of Abenomics a bit of support, at least on the demographic front. It shows that deflation is not the preordained outcome of ageing.

The problem lies not in identifying the possible links between ageing and prices, but in working out which way they cut. Consider the factors of production. When growth slows businesses rein in investment, so the cost of capital may decline. Yet wages ought to rise when the supply of workers falls. In the realm of fiscal policy, some indebted governments may make painful cuts as pensioners multiply, leading to slow growth and sluggish inflation. But others may opt to monetise their debt, pushing inflation up. (Some suspect this is the ultimate aim of Abenomics.)

How to disentangle these possibilities? In a recent working paper, Mitsuru Katagiri of the Bank of Japan and Hideki Konishi and Kozo Ueda of Waseda University distinguish between the ageing caused by a falling birth rate and that brought on by increased longevity. The main effect of fewer births would be a shrinking tax base; that might prompt the government to embrace inflation to erode its debts and thus stay solvent. But longer lives would cause the ranks of pensioners to swell; their increased political influence, in turn, would augur for tighter monetary policy to prevent inflation eating into savings.

In the case of Japan the authors estimate that the ageing process has led to deflation of about 0.6 percentage points a year over the past 40 years—a huge cumulative impact. That, they believe, is because the big surprise in Japanese demography has been ever-increasing longevity. Fertility rates are close to the levels projected in 2002, but the government has steadily revised up its estimates of lifespans. It is unexpected longevity, not simply ageing, that has been deflationary in Japan.

What about the impact of ageing on financial assets? Economic theory—"the life-cycle hypothesis"—holds that people smooth their consumption over their lifetimes, going into debt when young, buying assets when their earnings peak and selling them to pay for retirement. That, in theory, should lead to lower asset values as countries enter their dotage, but the empirical record is mixed: house prices often fall, but stocks sometimes rise.

An important variable is whether assets sold by pensioners are domestic or foreign. Derek Anderson, Dennis Botman and Ben Hunt of the International Monetary Fund looked at the decrease in Japan's net savings rate from some 15% of disposable income in the early 1990s to about zero in 2011. What stands out is that many of the liquidated savings had been invested in foreign assets. When Japanese pensioners sold stocks and bonds abroad and repatriated the funds, they fuelled an appreciation in the yen—a consistent problem until 2012. This in turn contributed to deflationary pressure, by lowering the cost of imports. But the researchers also reckon that strong monetary easing combined with a credible commitment to an inflation target would have been sufficient to negate the effect of ageing. In other words, they believe Japan needed Abenomics long before it got it.

## Greyflation

A recent paper by Mikael Juselius and Elod Takats for the Bank for International Settlements offers a very different take on how ageing affects inflation, suggesting that Japan may not be typical after all. They look at 22 advanced economies from 1955 to 2010. Japan is, after all, not the only country to have experienced deflation. Sure enough, they find a steady correlation between deflation and demography, but just the opposite of what is commonly assumed. A larger share of dependents—both young and old—is associated with higher inflation, whereas having more people of working age is linked to lower inflation. Their explanation, albeit tentative, is straightforward. Countries with more people consuming goods and services than producing them are liable to have excess demand and thus inflationary tendencies. Those with more producers than consumers will, by contrast, have excess supply and a deflationary bias.

That raises the question of why prices in Japan have fallen for so many years, given its rapidly ageing population. There are several potential culprits: the damaged balance-sheets left by the popping of the asset bubble of the 1980s, say, or the hesitant monetary policy before Mr Abe. But if the paper's thesis holds true, an ageing population could yet lead to rising prices in the coming years. As the Bank of Japan seeks to vanquish deflation, demography may turn out to be friend, not foe. ■

* Studies cited in this article can be found at www.economist.com/ageing15

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Advanced weapons

# Rail strike

**America's navy wants to arm its ships with electrically powered superguns**

FOR all the centuries of refinement that separate a modern rifle from a Renaissance arquebus, the basic idea has not changed. That idea is to convert the chemical energy stored in an explosive into kinetic energy stored in a speeding projectile.

But there is nothing to say that chemicals have to provide the kick. Indeed, the physics of chemical explosions put a limit on what a conventional gun can realistically accomplish. In an attempt to get around those limits, America's navy is trading explosives for electricity and working on a railgun, a weapon designed to hurl shells at seven times the speed of sound. Prototype systems at the Naval Surface Warfare Centre, in Virginia, have been firing since 2006. If all goes according to plan, the first firing tests on board ship will take place next year.

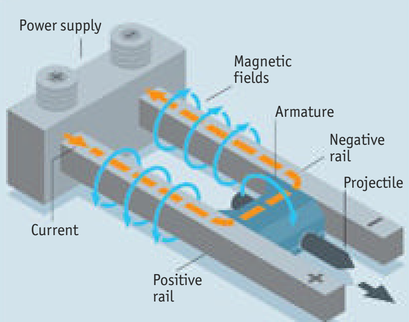
Railguns are a staple of science fiction. The idea dates back to 1919, when a French inventor called André Louis Octave Fauchon-Villeplée filed a patent for an "Electric Apparatus for Propelling Projectiles". Unlike other sci-fi staples, such as laser blasters and particle-beam weapons, railguns are conceptually simple—simple enough, indeed, that a hobbyist can build one at home (many do, and upload footage of their creations to YouTube).

As the name suggests, a railgun dispenses with the enclosed barrel employed by explosively propelled artillery in favour of a pair of electrically conductive rails (see diagram). This creates a linear electric motor. The motor's moving part—its armature—sits between the rails and carries a projectile. When someone presses the trigger, current flows up one rail, through the armature and down the second rail. This generates a set of magnetic fields that accelerate the armature, and thus the projectile, forward along the rails and propel it out of the muzzle of the gun.

That, at least, is the theory. Building a useful weapon has proved tricky in practice, for such a device requires a great deal of power. The currents involved—millions of amps—are difficult to generate, and they place huge stress on the system. The same force that flings the projectile out of the gun also tries to force the rails apart. The faster the muzzle velocity, the stronger the rails must be, both to avoid buckling and to resist erosion from the friction created by the accelerating armature. Early attempts at building a railgun were plagued by the need to replace the rails frequently, sometimes after every shot.

Two firms have been working on the navy's railgun—BAE Systems and General Atomics. Amir Chaboki, the project leader at BAE, is coy about what advances in metallurgy, materials science and electrical engineering have made a useful weapon possible. But he says his firm's weapon should be able to go hundreds of shots between rail replacements. And, thanks to the trend for "electric boats", in which a warship uses electric power for everything from the lights in the captain's bathroom to the main engines, vessels with enough juice to fire the weapon are now coming into service. USS *Zumwalt*, the first of a new class of destroyers that have enough power generation to run a railgun, will be commissioned soon.

**Shell shock**




Source: *The Economist*

## Speed kills, cheaply

The brief given to the companies is to develop a weapon that can fire a 10kg projectile at about 2.5km a second. This is roughly seven times the speed of sound—and about three times the muzzle velocity of a conventional naval gun. At those sorts of speeds, there is no need to give the projectile a warhead. Its momentum is enough to cause destruction. The design has a muzzle energy of 32 megajoules, which is roughly the kinetic energy that would be carried by a small hatchback doing 900kph. The fiery ▸▸

plume, visible in the photograph, that accompanies the projectile out of the gun is not the result of propellant exploding but of the air itself being ionised by the electric current in the barrel.

The sheer destructive potential of the new weapon, though, is not the main point. Although a railgun's speed makes plenty of headlines, old-style naval guns—such as the 16-inch monsters found on second-world-war battleships—had muzzle energies ten times as high. Modern ship-launched cruise missiles can deliver large explosive warheads to targets hundreds of nautical miles away.

Instead, says Commander Jason Fox of Naval Sea Systems Command, the part of the navy responsible for railguns, the weapon offers three other advantages. One is range. The projectile's speed means ships could attack other vessels, or bombard targets on land, from a distance of 110 nautical miles. That is much farther than existing naval guns can manage, and beyond the range of at least some shore-launched anti-ship missiles.

### Safe for some

Another advantage is safety. If a ship is hit by enemy fire, its magazine of high-explosive shells can detonate, with potentially devastating consequences. A vessel equipped with railguns would have only inert slugs on board, so would not face that risk. (As a bonus, the modest dimensions of the projectiles would allow more of them to be stored.)

But the biggest advantage, says Commander Fox, is cost. A single ship-launched missile can set the navy back well over $1m. Current estimates for railgun projectiles are around $25,000 per shot. Even given the tendency for costs to swell, that is a dramatic saving. And not even America's military budget is infinite.

Like Dr Chaboki, Commander Fox is coy about specific tactical applications for railguns, beyond long-range bombardment—although he says that the next challenge will be to work out a way to guide the projectiles, to permit accurate fire from a hundred miles' distance. One navy document talks about rail guns (suitably upgraded for an even longer range) as providing more shore-bombardment ability than an aircraft-carrier's worth of planes.

Peter Roberts, a naval expert at the Royal United Services Institute, in London, thinks that smaller versions of the weapon could one day find uses as anti-aircraft guns or anti-missile weapons, applications where their enormous speeds would make them hard to evade. Nor, says Mr Roberts, are the Americans the only ones pursuing the idea. Researchers in China are thought to be working on a similar system. If and when someone manages to perfect one, the centuries-long monopoly of gunpowder will have come to an end. ■

The origin of complex life

# Shape-shifters

**The ancient ancestors of animal and plant cells have just been identified**

FROM humanity's point of view, one of the most important events in history was the evolution of the eukaryotic cell—the sort from which people's bodies are made. Without this innovation, which happened about 2 billion years ago, life on Earth would consist only of bacteria and a group of similarly simple creatures called archaea. Plants and animals, not to mention algae, fungi and myriad single-celled organisms like amoebae, would never have come into existence. Even today, bacteria and archaea are probably more important than eukaryotes to the smooth running of the biosphere. But because they are invisible to the naked eye, they are easily overlooked. Eukaryotes are what people think of when they think of living things.

Biologists generally agree that the first eukaryote arose when an archaeon swallowed a bacterium and, instead of digesting it, formed a symbiotic partnership with it. The swallowed bacterium came from a group called the Alphaproteobacteria. Its descendants, known as mitochondria, inhabit eukaryotic cells to this day, and pay their way by acting as the cells' power packs. That mitochondria hail from Alphaproteobacteria is known because they retain genes of their own, independent of a cell's nucleus, and these genes are clearly related to those of Alphaproteobacteria.

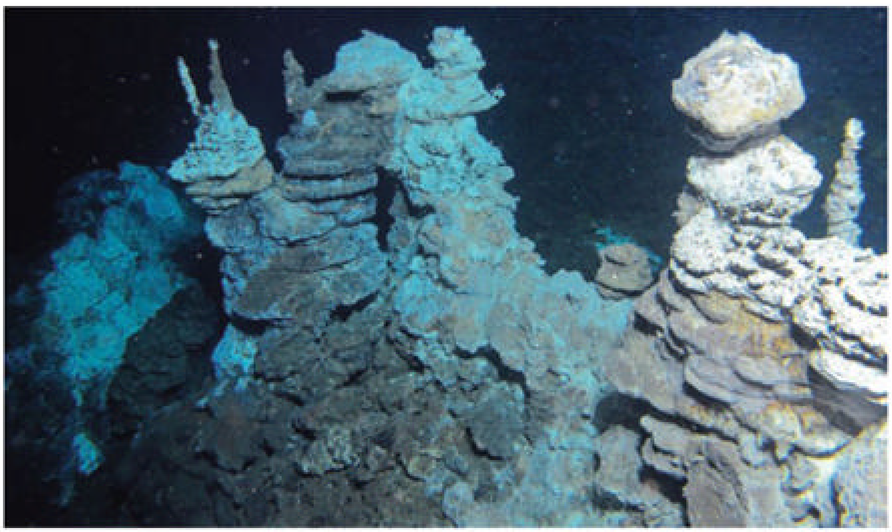
What remains unknown—or did until this week—is the nature of the archaeon that did the swallowing. But a paper in *Nature*, by Thijs Ettema of Uppsala University, in Sweden, and his colleagues, has gone a long way to clearing up the mystery.

Archaea look like bacteria, but their molecular biology is radically different. Together with eukaryotes and bacteria, they are regarded as one of the fundamental domains of life. But archaea are harder to cultivate than bacteria, and are poorly understood as a result.

Dr Ettema has been looking at a habitat rich in them. It is part of the Atlantic seabed, south of Svalbard, a dozen kilometres from an underwater volcano called Loki's Castle (pictured). When he delved into the genetics of the area's archaea he got a surprise. Maps of genetic relatedness suggest the group to which these inhabitants belong, which he and his colleagues dub Lokiarchaeota, also embraces the eukaryotes. The ancestral eukaryote, *sans* mitochondria, was, it seems, a Lokiarchaeote.

Moreover, the Lokiarchaeota themselves turn out to be intriguing creatures. Dr Ettema's analysis of them shows proteins that are not found in other archaea—but which are present in eukaryotes. These include actin, a component of the protein skeletons that give eukaryotic cells their shape. These "cytoskeletons" also help organise such cells' interiors, which are full of structures known as organelles (of which mitochondria are but one example), that are absent from bacteria and archaea. It is the organelles that give eukaryotes their sophistication.

Cytoskeletons can change shape. They thus, by pulling and pushing from the inside, change the shape of the cell they are in. This is what allows things like amoebae to move around and engulf their prey. Something similar is assumed to have happened when the ur-eukaryote engulfed the ur-mitochondrion. Whether modern Lokiarchaeota can manage the same trick remains to be seen. But if they are so able, it will be a nice coincidence—for Loki, the Norse god after whom they are named, was able to change his shape at will. ■



Home, sweet home

Space telescopes

# A glittering prize

### How to study the heavens with a handful of dust

GETTING a telescope into orbit is challenging and costly. Astronomers want instruments with the biggest mirrors possible. Big mirrors gather more light, so can see fainter objects. They also have higher magnification, so can resolve finer details. There is a limit, though, to the size and weight of mirror that can be lifted into space on a rocket.

Size can be dealt with by clever design—for example, making a mirror out of hexagonal petals that fold up on top of one another for launch. This is the approach being taken for the forthcoming *James Webb* space telescope. Weight, though, will always be a problem. What is needed is a radical rethink about what mirrors are made from. And Marco Quadrelli of the Jet Propulsion Laboratory, in Pasadena, California, and Grover Swartzlander of the Rochester Institute of Technology, in New York state, have now provided one.

Their idea is to launch a rocket full of tiny, reflective particles, jettison said particles and then sculpt the resulting cloud of glitter into the shape of a telescope mirror, using laser beams. The lasers would sit on board satellites in orbit close to the cloud.

Shining a laser at something exerts two forces on it. One is in the direction that the beam is travelling, and tends to push the object struck away from the beam's source. This is known as the scatter force. The other acts at right angles to the beam, and is known as the lift force. Combine the lift force and the scatter force appropriately, and you can wrangle a cloud of glitter into any shape you like—including the concave surface of a telescope's primary mirror.

Even if each piece of glitter were perfectly in place, though, such a mirror would not be a continuous surface. That means any pictures it took would be speckled. To get around this, the researchers propose snapping many shots of the same thing. Random drift of each bit of glitter means every shot will have different speckles. Armed with enough shots, a computer could work out what was signal and what speckle—and subtract the latter from the picture.

This, at least, is the theory. And part of it has now been tested. On April 15th Dr Swartzlander said he had shown that a glitter mirror can indeed create a speckle-free image. He and his colleagues made their mirror by sprinkling glitter (actual party glitter, silver-coloured, and bought from a local shop) across the surface of a concave lens. They then pointed their creation at a laser simulation of a double star (a pair of stars that appear close to one another) and recorded what was reflected. The result, when run through a computer to eliminate the speckle, resolved the simulation into its two components in the way that a more conventional mirror would have done.

Of course, doing something in a laboratory and doing it in space are rather different things since, besides recording the image, there is the little matter of shaping the glitter into a mirror in the first place. But, as Dr Quadrelli points out, the tolerance required for this depends on the wavelength of what is being observed. An infra-red or microwave signal does not need the glitter to be positioned so precisely as it would have to be to form an image out of visible light. Even if it proved impossible to make an optical-frequency version, then, a glitterscope could still do useful work.

An initial test in space would probably involve sculpting a mirror the size of a bottle-top. If that went well, there would be no obvious limit on the size of a glitterscope—beyond, that is, the difficulty of herding a zillion pieces of dust. ■

Liquid-nitrogen engines

# Cool thinking

### An inventor's persistence may be about to pay off

LIQUID nitrogen seems a good place to start if you want to cool something down. If Peter Dearman, a British inventor, is correct, it might be even better than it looks. Mr Dearman is a man with a bee in his bonnet. He has dreamed, since he was 15, of making a useful motor powered by liquid nitrogen. Now, at 64, he thinks he has done it—not, as he had originally imagined, to run a car, but to run a refrigerator that promises to be more efficient and less polluting than conventional alternatives.

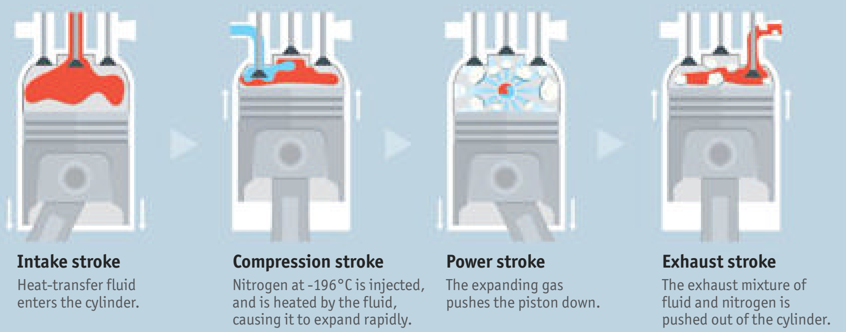
The Dearman engine works a bit like a steam, petrol or diesel engine. It uses heat to expand a gas (known as a working fluid), which drives a piston. The difference is that instead of starting at room temperature the working fluid ends up there, and starts instead at -196°C, the boiling point of nitrogen. That temperature change, and the expansion of the nitrogen it causes, is enough to do work equivalent to a more conventional heat engine—but not, sadly, much better than such an engine. Nitrogen engines have thus, for most of Mr Dearman's life, been an idea looking for an application. Now, though, he thinks he has found a niche whose incumbent he can replace—the inefficient, pollution-generating diesel-powered refrigerators that keep the contents of food-delivery lorries cold.

The challenge was to extract more cooling power from liquid nitrogen via the engine than can be garnered by using it directly. Mr Dearman was able to do so by dividing the labour of cooling into two. First, instead of injecting liquid nitrogen directly into the engine's cylinder, his system boils it by running it through a system of pipes called a heat exchanger. This apparatus is connected to the compartment to be refrigerated, and sucks heat out of that compartment and into the nitrogen, which turns from a liquid into a gas.

This process cools the compartment but does not raise the nitrogen's temperature, which remains at -196°C. That is because the heat in question, known as latent heat of vaporisation, serves merely to change the nitrogen's state, not to warm it up. The resultant cold, gaseous nitrogen is now injected into the engine's cylinder (see diagram) along with a mixture of water and glycol, known as a heat-transfer liquid, that is at room temperature.

The heat-transfer liquid rapidly warms the nitrogen, causing it to expand and drive the piston—which powers a conventional refrigeration circuit that provides a second dose of cooling to the cold compartment. The piston's return stroke then expels the gas and the now-cooled heat-transfer liquid. The nitrogen is vented to the air, and the heat just extracted from the cold com- ▸▸

Nitrogen cycle




Source: Dearman

partment by the conventional refrigeration circuit is used to warm the heat-transfer liquid back to room temperature, ready to be used again.

This double cycle extracts 40% more cooling power from liquid nitrogen than systems which use the stuff directly as a coolant. That makes it competitive with the conventional, diesel-powered refrigerators now used in chiller lorries. Its crucial advantage over diesel, though, is that it is pollution-free. Nitrogen is 78% of air, so a little more will make no difference. The tiny particles of soot that refrigerator diesel engines produce, by contrast, are a health hazard up with which regulators are increasingly unwilling to put. Mr Dearman's engine, now undergoing trials, provides an alternative. If it proves itself, the bees in his bonnet may at last yield some honey. ■

How music evolves

# First principals

**Statistical analysis of music reveals the truth about its periods of revolution**

THE Stones or the Beatles? That, as any baby-boomer knows, is the most important question in music. But for American boomers it raises a second question. Were those two bands really responsible for the revolution of 1963 and 1964 which those west of the Atlantic call the British Invasion, and those to its east just think of as the beginning of modern popular music?

Matthias Mauch of Queen Mary, a part of the University of London, and Armand Leroi of Imperial College decided to attack this second question, and other, similar ones, in a scientific manner. As they report this week in *Royal Society Open Science*, they took their data from the Billboard Hot 100, the standard music-industry chart for singles in America. They used Last.fm, a music-streaming service, to collect 30-second clips from 17,094 songs (86% of the total) that were in this chart between 1960 and 2010. Then they attacked each clip with sonic analysis and statistics.

They found that they could extract what they describe as "topics" from the music. These were coherent harmonic and timbral themes which were either present in or absent from a clip. Harmonic topics, of which there were eight, captured classes of chord change, or their absence (eg, "dominant 7th-chord changes" and "major chords without changes"). Timbral topics, of which there were also eight, were things like "drums, aggressive, percussive" and "female voice, melodic, vocal".

As might be expected, different genres (as defined by the way tracks were tagged by users of Last.fm) were over-represented in certain topics. Songs tagged "jazz" or "blues", for example, had a high frequency of topic H1 (that pertaining to dominant 7ths). H3 (involving minor 7ths) is commonest in funk, disco and soul. T3, a timbre topic described as "energetic, speech, bright" is found especially in hip-hop.

As might also be expected, the rise and fall in frequency of these topics tracked the rise and fall of genres. But Dr Mauch and Dr Leroi thought they could do better than just following human-assigned genres. By applying a statistical technique called principal-component analysis to the distribution of topics, they were able to divide modern, popular music into 13 genre-straddling "styles" (one, for example, draws from "rock", "classic rock", "pop" and "new wave" while another draws from "rock", "hard rock", "alternative" and "classic rock"). They could then follow the waxing and waning of these styles over the years.

Further statistical processing, which looked at how the mix of styles in a given quarter differed from those in previous and future quarters, revealed when that mix was shifting rapidly and when it was stuck in a rut.

As the chart shows, there were three periods of rapid change. The first is from 1963 to 1964—the period of the British Invasion. Though this appears to be the smallest, that is probably an illusion caused by there being few previous quarters to compare it with. The second is in the early 1980s. The third is around 1991. These revolutions do all correspond with times musical critics would have said change was happening (classic rock, new wave and hip-hop respectively), but this analysis suggests other apparent novelties, such as the punk of the 1970s, were not the revolutions that their fans might like to believe.

The principal-components technique can also answer the question of whether, and to what extent, British bands drove the revolution of the early 1960s. Dr Mauch and Dr Leroi looked at the styles of Hot 100 songs by the Beatles and the Rolling Stones, who between them made 66 appearances in that chart before 1968.

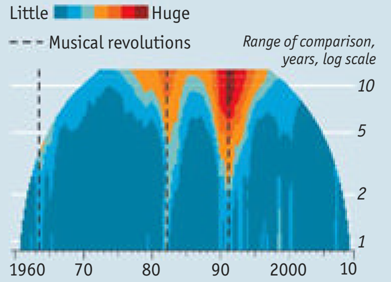
Their conclusion, paraphrased, is that although the British did not start the revolution, they were perhaps its Bolsheviks—pushing it to a conclusion it would otherwise not have reached. Signs of change are perceptible before the Beatles and the Stones arrive on the scene. But when they do arrive, they bring with them styles characteristic of the subsequent era: styles that other bands took time to adopt.

Dr Mauch and Dr Leroi seem, then, to have devised a useful way of analysing cultural evolution. They are now applying it to popular music back to 1940, and to folk music, and it is possible to imagine it being applied to non-musical fields, too, if ways of quantifying elements of those fields (the cut of clothes, for example) can be devised.

Of course, their method is not all-powerful. It cannot, for example, answer the question posed at the beginning of this article. Luckily, science is not needed for that one. It's obviously the Stones. ■

**Rocking all over the years**

Difference of "style" between a quarter and previous and subsequent quarters




Source: *Royal Society Open Science*

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Museum succession in America

# Onwards and upwards

NEW YORK

**More than a third of American art-museum directors are of retirement age. Those in charge of appointing the next generation must focus on three major issues**

RUNNING an American museum ain't what it used to be. To see how much the job has changed you need only look at the differences between Glenn Lowry, head of the Museum of Modern Art (MoMA) in New York, and Alfred Barr, its first boss. Since he started in 1995, Mr Lowry has doubled the museum's footprint and quadrupled its endowment to nearly $1 billion. Barr, a former academic who became director in 1929, was a leading figure in the modern-art movement in America, but he lived at a far slower pace. Once, while reading out a passage by Lenin in a speech, he fell silent. After a long pause, he looked up and apologised to his audience: "I'm sorry. I got interested."

Over the years American museum directors have become responsible not only for questions of aesthetics but, increasingly, for the business side of their institutions too. They are both artistic director and CEO. Given the relatively meagre public funding for the arts in America, the CEO element is no small part of the job and helps explain why, in many cases, the identity of a museum is so closely tied to its leader—*le musée, c'est moi*, if you will.

A survey by *The Economist* of nearly 150 art museums, all members of the Association of Art Museum Directors (AAMD), shows that more than a third of directors are aged 60 or over and approaching retirement (the median age of chief executives at S&P500 companies is 54; only a quarter are 60, according to Spencer Stuart, a recruitment firm). Museum-watchers had predicted the beginnings of a vacuum at the top of American art museums when the financial crisis hit in 2008. Although a number of appointments have since been made, turnover has been slight, says Sarah James of Phillips Oppenheim, a headhunting firm which over the past year has been involved in recruiting new directors for the Morgan Library and Museum in New York, the Museum of Fine Arts (MFA) Boston, the Detroit Institute of Arts (pictured) and the Wolfsonian Museum in Miami Beach. Many museum directors stayed in their jobs for fear of disrupting their institutions at a time of uncertainty. Now that the global economy has levelled out, Ms James says, "the turnover that was supposed to happen over five years might happen in the next 18 months."

The impending influx of new blood at the top offers museums an opportunity to rethink the job and question many of the assumptions that underlie traditional museum operations: the emphasis on splendid buildings, the primacy of curatorial authority and the balance between rich donors, for whom museums are often personal vanity projects, and the public, who see museums as shared common goods.

To understand the issues facing selection boards, it is important to know how the job came to be as it is. Museum directors everywhere tend to be curators first, with most cutting their director's teeth on small institutions before moving on to bigger ones. The job has become more demanding, however, as visitor numbers and exhibition spaces have grown while public spending on the arts has been cut. American art museums doubled in size in the 25 years to 2007 and attendance grew by 90%, according to a study in 2009 by Janet Meredith, a cultural consultant. (In a survey conducted last year for the first time, "Art Museums by the Numbers, 2014", the AAMD estimates that its museums receive just over 61m visitors a year.)

With this growth came the need for more money and for more directors who are skilled at both fund-raising and spending. AAMD figures indicate that American art museums receive just 18% of their revenue from public sources, a far smaller proportion than 25 years ago. (The Prussian Cultural Heritage Foundation, the single most important overseer of museums in Germany, by contrast, is entirely funded by the state.) American art museums get their remaining revenue from admissions, shops, renting out facilities and other commercial activities (31%) and endowment income (21%). The largest proportion, though—just under a third—is the fruit of private and corporate fund-raising.

Splitting the top job into artistic director and business head, a model common in the performing arts, has never caught on in the museum world. The long-standing emphasis on scholarship, lower production costs and admission fees, and the commitment to providing a service for the public mean museums have little in common with performing-arts corporations. Those that have tried to split the top job have often been unhappy. In 1995 Andrea Rich moved from being the administrator of University of California, Los Angeles, to being president and CEO of the Los Ange- ▸▸

les County Museum of Art (LACMA), only to become embattled and lose her art director four years later. Jeffrey Deitch, an art dealer, took the managerial reins at the Los Angeles Museum of Contemporary Art (MOCA) in 2010 and then clashed with the well-respected chief curator, Paul Schimmel, whom he later fired. Four artists on the MOCA board resigned in protest, and Mr Deitch was forced to quit.

Museum boards have come to realise that an artistic leader needs to be able to secure funding on faith, and that a business leader needs to be able to understand and articulate a respectable curatorial vision; for these reasons the job should ideally fall to one person. "You need a director who can make a case for that support," says Maxwell Anderson, director of the Dallas Museum of Art (DMA).

### Future challenges

Refashioning museums to appeal to future generations means devising a new vision. Up-and-coming directors face three major challenges: engaging more imaginatively with audiences, addressing America's changing demographics and negotiating the ever more delicate balance between rich donors and the public.

Audience engagement has to do with a museum's relevance and its impact on its community. The simplest measure is attendance figures. Engaging younger audiences is key, though; the National Endowment for the Arts reports that in the decade to 2012 the only age group that saw a marked growth in attendance was those aged 75 and older. This must change.

One way to engage young people is through education programmes. The American Alliance of Museums' (AAM's) Centre for the Future of Museums, a research and advisory office in Washington, DC, shows that $2 billion a year is spent on such programmes, resulting in 55m visits by school groups. In 2011 the Institute of Museum and Library Services and the MacArthur Foundation launched "Learning Labs in Libraries and Museums" to try and find new ways of interesting teenagers. Nine museums were involved, including the main art museums in Dallas and Houston. (There are practical reasons too for courting younger audiences; museums one day will rely on the millennial generation for its endowments.)

Some museums have been good at increasing attendance through the internet. In 2010 the Indianapolis Museum of Art had nearly 430,000 visitors, but its robust website, where viewers can peruse its collections and watch videos, helped raise the number of web visitors to over 1m in just three months. In the same year the Solomon R. Guggenheim Museums started a YouTube Play project, which yielded more than 23,000 submissions from 91 countries. Then there are more experimental ideas, like the friends programme at the DMA, which tracks individual visits. In two years the DMA has signed up 100,000 friends; similar projects are planned for the Denver Art Museum, LACMA and the Minneapolis Institute of Arts.


If museums are to make any headway in engaging with audiences they must also work on broadening their appeal. Last month the AAM annual conference was told that the three Ws of traditional museums are white, Western and "womanless". In 2010 the Centre for the Future of Museums reported that minorities made up just 21% of museum visitors, compared with over a third of America's population. In 30 years, according to the Census Bureau, minorities will make up half the population, so there is no time to waste.

But engaging minority audiences is not easy. As Michelle Obama said when she opened the new Whitney Museum of American Art in New York on April 30th, "There are so many kids in this country who look at museums and concert halls and other cultural places, and think to themselves: 'Well, that's not a place for me.'" Some have made efforts to bring black voices into the museum, like the High Museum in Atlanta's popular "Inter-Sessions" talk series which pairs hip-hop artists with figures from the art world, though other efforts, like MOCA's "Art in the Streets" in 2011, were pilloried as pandering to minorities.

**Wise head**

Part of the problem is that the pool of potential art-museum directors in America is a long way from reflecting the country's racial diversity, despite high-profile curators, such as Okwui Enwezor, who has overseen the 2015 Venice Biennale, and Thelma Golden, director of the Studio Museum in Harlem. Michael Govan, LACMA's director, calls engaging new, diverse audiences "the most urgent issue for museums right now". Last month, in the keynote address to the AAM's annual conference, Johnnetta Cole (pictured), the 78-year-old director of the Smithsonian National Museum of African Art, said the most important book for museum directors should be the national census. Her call was aimed in part at museum-studies courses at universities, which are still 80% white. Only two stand out for their efforts to place black students in museum jobs, one associated with the Smithsonian and the other with the Saint Louis Art Museum.

Museum-studies programmes are, however, overwhelmingly filled by women, which makes the shortage of leading female museum directors all the more inexplicable. In museums with operating budgets of up to $250,000, women directors outnumber men by a factor of two to one. But that picture changes with bigger museums. Of the 30 museums with budgets of more than $20m in 2013, only five were run by a woman.

### Plaything or academy?

The biggest challenge facing new directors, though, will be keeping true to the idea of what a museum should be: a plaything for rich collectors whose philanthropy comes with an increasing number of conditions, or a precious centre of public education. In her speech Ms Cole reminded AAM delegates that baby-boomers still control 70% of the nation's disposable income, and that wealth is being concentrated in fewer and fewer hands. Navigating successfully between these competing visions will separate the best art-museum director from the rest. The Art Institute of Chicago recently beat off MOMA, among others, to secure 42 works valued at $500m from the collection of Stefan Edlis, a retired plastics manufacturer, and his wife. The Chicagoans promised Mr Edlis they would show the works as a group for 25 years in a new modern wing designed by Renzo Piano. By contrast, the board of the Museum of Contemporary Art North Miami last year decided to remove its collection, because, among other things, it did not like the new city-appointed director. Instead, it decided to start a new museum, the Institute of Contemporary Art.

Elizabeth Merritt, founding director of the Centre for the Future of Museums, says she thinks some of the most successful future directors may well come from non-traditional backgrounds: technology, journalism or community work: "not because those sectors are more successful than museums, but because an 'outsider' would bring a fresh perspective to our work."

Expensive expansions often lead to change at the top as trustees, their nerves frayed by delays and cost overruns, adjust to reality. All too often opening a new building marks less an end than an unwieldy—and costly—new beginning. It happened at the Milwaukee Art Museum, the Indianapolis Museum of Art, the Walker Art Centre, the Phillips Collection and the Bellevue Art Museum. In the past year in Boston alone, the heads of the three major museums—the MFA, the Harvard Art Museums and the Isabella Stewart Gardner Museum—announced that they would be leaving, after a big expansion. Their successors—indeed all new museum directors—must aim, chiefly, to ensure their missions match the needs and tastes of their future beneficiaries. Or risk becoming irrelevant. ■

American history

# Moral of the story

**The Quartet: Orchestrating the Second American Revolution, 1783-1789.** By Joseph Ellis. *Knopf; 320 pages; $27.95*

Creation myth

JOSEPH ELLIS begins his latest book, "The Quartet", with the observation that Abraham Lincoln's most famous speech was a fine bit of eloquence but a bad piece of history. Delivering his eulogy on November 19th 1863, over the freshly dug graves at Gettysburg, the president began: "Four score and seven years ago our fathers brought forth on this continent, a new nation." To which Mr Ellis responds, a bit cheekily: "No, not really."

What follows is a clever framing of a familiar topic. Mr Ellis, a Pulitzer prize-winning historian, points out that the real work of nation-building began later, in the years between the successful conclusion of the revolution in 1781 and the final adoption of the constitution in 1789, and that this epochal achievement was largely the work of four men of genius who stemmed the centrifugal forces set in motion by the rebellion and forged a new nation out of an inchoate mass.

Not only did this quartet—George Washington, Alexander Hamilton, James Madison and John Jay—weld the 13 quarrelsome states into a single coherent unit, but they did so also against long odds. An almost universal mistrust of centralised authority was at the heart of the American revolution. As Mr Ellis explains, the feebleness of the national government created by the Articles of Confederation was regarded by most Americans as a positive virtue. Without the tenacity of a few visionary men, the newborn nation would have died in its cradle.

None of this will be new to anyone familiar with American history, and, indeed, this is a story that has been often told, if rarely with the lucidity that Mr Ellis brings to bear. The author is a sure-handed and entertaining guide through the thickets of argument, personality and ideology out of which the American nation emerged, particularly when he exposes the all-too-human motives of men now regarded as paragons of wisdom and virtue. In pushing through the Bill of Rights, for instance, Madison was less interested in eternal verities than he was in short-term political gain. Washington's nationalism was informed, in part, by the 30,000 or so acres that he owned in the West, the value of which depended on a strong central government.

But in focusing on a few exceptional men, Mr Ellis also deprives his narrative of vital context. From the beginning it is an unequal contest, pitting the visionaries against the narrow-minded, the righteous few against the feckless many. None of their opponents—with the possible exception of Patrick Henry, who makes a cameo appearance near the end of the book engaging in oratorical fisticuffs with Madison over Virginia's ratification of the constitution—rises to the stature of Mr Ellis's heroes, or even their supporting cast. Their most doughty opponent, it turns out, is the amorphous "spirit of '76", which makes the book less a clash of titans than an exercise in shadow boxing.

Mr Ellis's strategy of building his narrative around four exemplary men certainly makes for more compelling reading than delving into tax rolls or birth registers. Inevitably, though, it also carries its own subtle bias. Although he occasionally draws the reader's attention to the moral limitations of the Founding Fathers, for instance calling their treatment of the native population one of the "less attractive features of the western story", this is largely a triumphalist tale. Mr Ellis is not blind to the moral compromises made in Philadelphia in 1787, but he accepts rather too complacently the notion that the constitution that emerged represented the best possible agreement under the circumstances. He praises the deliberate ambiguity over state versus federal sovereignty as a clever tactical manoeuvre, and dismisses critics who impose 21st-century values such as racial equality on 18th-century men as "historically irresponsible", concluding that "they maximised the historical possibilities of their transitory moment."

This, then, is a success story, and Mr Ellis's narrative a tribute to the men who made it possible. "Their genius was to answer the political challenges of their own moment decisively," he writes, "to allow for considerable latitude within which future generations could make their own decisions." Given where he began the book, at Gettysburg in 1863, this seems far too rosy a judgment. It took more than friendly debate to complete the unfinished business of 1787, and though Mr Ellis's heroes achieved much, any fair accounting of their work would have to weigh in the balance not only the suffering of those whose chains they failed to break but those who died in bloody conflict less than four score and seven years in the future. ■

Biography

# A man for all seasons

**Universal Man: The Lives of John Maynard Keynes.** By Richard Davenport-Hines. *Basic Books; 416 pages; $28.99. William Collins; £18.99*

A BIOGRAPHY of John Maynard Keynes without the economics may seem like "Hamlet" without the prince. But Richard Davenport-Hines has set out to write such a book, and the result is utterly absorbing. His argument is that Keynes deserves to be remembered for much else besides his economic works: in addition to being an economist, the great man was also a boy genius, a civil servant, a national opinion-shaper, a lover, a connoisseur and aesthete, and a statesman. Indeed Keynes himself wrote: "The master-economist must possess a rare combination of gifts…He must be mathematician, historian, statesman, philosopher—in some degree."

Keynes saved Britain from financial ruin at least twice, the author argues: first by preventing calamity at the outbreak of war in 1914 when the City of London's debt markets ground to a halt, and second by hectoring America to reduce Britain's second-world-war debts. Partial success allowed the post-war Labour government to fund its welfare state and National Health Service. Keynes's sagacity and wit shifted public opinion. In magazine articles and on campaign stumps he savaged the Versailles treaty as vindictive and the gold standard as a "barbarous relic". He backed the Liberals in calling for spending on public works after the Depression.

Much of this will be familiar to readers of countless books on Keynes, including Lord Skidelsky's definitive biographies. But Mr Davenport-Hines manages to pick out little-known stories, brilliant details and curiosities, relayed with affection. Edwardian Whitehall in its imperial pomp is clearly painted. Civil servants at the India Office were required to work from 11am to 5pm on weekdays and from 11am to 1pm on Saturdays, with an hour for lunch and two months' holiday. Keynes said of the ministry's upper echelons: "Half of those present showed manifest signs of senile decay, and the rest didn't speak." Character sketches, Mr Davenport-Hines's great talent, reveal a horde of Treasury oddballs. Classicists, versifiers, an expert in Byzantine Greek and a translator of sacred Buddhist texts all helped set fiscal policy.

Keynes's early gay love-life is laid out in full detail. Where Lord Skidelsky was tight-lipped, Mr Davenport-Hines is garrulous. It helps that the economist recorded his sexual statistics. In the nine months to February 1909 he records that he had 61 encounters, with 65 more the following year. Like a philatelist, Keynes kept a list of conquests: "…the actor of Whitechapel, 16-year-old under Etna, lift boy of Vauxhall, Jewboy, Grand Duke Cyril of the Paris Baths". The revolutionary economic thinker becomes "Maynard, the iron copulating machine", according to an ex-lover.

There is poignancy here too. In the years after Oscar Wilde's trial for gross indecency, many of Keynes's lovers committed suicide or married women. Keynes himself married Lydia Lopokova, a Russian ballerina, with whom he had a sexual relationship. His letters to her reveal a deep love that grew with age.

The portrait of Keynes the aesthete is just as stirring. He helped the National Gallery buy major Impressionist works. He saved the Royal Opera House from demolition. In 1942 he was appointed chair of the Committee for the Encouragement of Music and the Arts, with Kenneth Clark, then director of the National Gallery, as deputy. Public money poured into the arts afterwards. Mr Davenport-Hines calls it a decisive moment in arts funding, though it happened, Keynes said, in a "very English, informal, unostentatious way". The story, like much else in this accomplished biography, ought to be better known. ■

Fiction

# The green, green grass of home

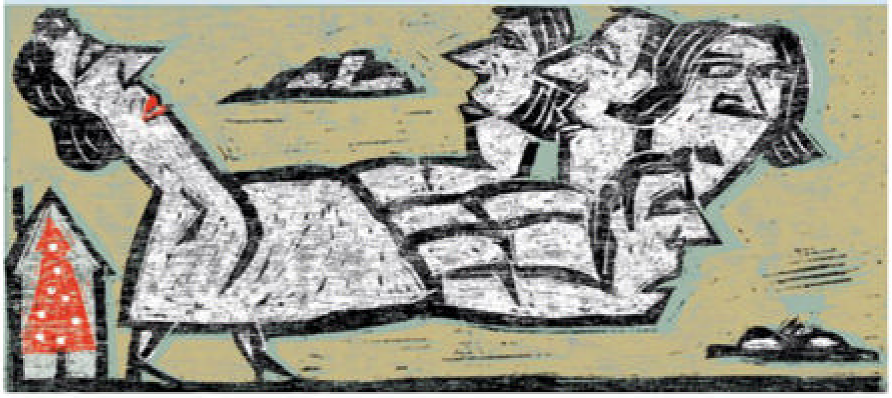
**The Green Road.** By Anne Enright. *Norton; 320 pages; $26.95. Jonathan Cape; £16.99*

FIRST she wrote magical realism like Angela Carter's, then she veered into non-fiction. But it was only when she focused on her native Ireland, investigating "the wound of family", first with "The Gathering", which won the Man Booker prize in 2007, then with "The Forgotten Waltz" in 2011, that Anne Enright really found her voice. She returns to it in her new novel, "The Green Road".

Intending to sell the family home, a widowed mother, Rosaleen Madigan, summons her children to County Clare for one final Christmas. The early part of the book ranges in time and place, from a New York beset by AIDS to rural Mali in west Africa and the flush of the Irish economic boom, allotting chapters to each family member. In the second half the Madigans gather: martyred, empathetic Constance; Dan, a gay failed priest; younger brother Emmet, hollowed out by aid work in Africa; and Hanna, an alcoholic first-time mother. Imperfect and ordinary, the siblings are overseen by their querulous mother, who feels that "every child she reared was ready with one grievance or another". Relations soon sour on Christmas Day, with consequences for all the family.

"The Green Road" analyses how randomly love can be allotted in families. As with the Irish boom, the security of family can be a mirage. Hanna reflects: "This is how they knew each other, the Madigans, they knew the timbre of a voice, the rhythm of fingers tapping on a tabletop, and they didn't know each other at all." Ms Enright has previously said that she wants to "meet people in their own heads" and her skill is there for all to see in the construction of the five voices. The many viewpoints also demonstrate the unreliability of each character; rarely do they align with the perception that others may hold of them. Yet by the end, the reader senses that the reunion has offered this family a psychological—if temporary—rebooting.

Vulnerable and lost, Rosaleen wonders in a rare moment of clarity about her children: "Why she could not be nice to them, she did not know. She loved them so much." A book of brawny prose sheathed in cool intelligence.



TRADE MARK EAST AFRICA

## REQUEST FOR PROPOSALS (RFP)

TradeMark East Africa (TMEA) wishes to invite consultancy **firms/consortiums** to participate in the following consultancies:-

- **PRQ20141671** Formative evaluation of Single Window Information for Trade (SWIFTs) Projects;
- **PRQ20141672** Formative evaluations of Non-Tariff Barriers (NTB's) to trade and the Capacity building programme on regional integration for MEACs; and
- **PRQ20141673** Formative evaluations of Traidlinks and the Rwanda and Uganda country programmes.

The Terms of Reference and the application forms are available on the TMEA website http://www.trademarkea.com/get-involved/procurement/. All queries quoting the above Tender Number and Title should be emailed to procurement@trademarkea.com. The closing date for proposal submissions is **June 8, 2015 (5.00 p.m. Kenyan time).**

Interested consultancy firms/consortiums must register and apply online ONLY on the TMEA procurement portal at the website: http://procurement.trademarkea.com. All attachments must be **10MB** or less.

**TMEA cannot answer any query relating to this tender three days or less prior to the submission deadline.**

TPA

## TANZANIA PORTS AUTHORITY

**ADVERTISEMENT**
**REQUEST FOR PROPOSAL (RFP)**

**TITLE: PROVISION OF CONSULTANCY SERVICES FOR SUPERVISION OF WORKS AND CONTRACT ADMINISTRATION FOR REHABILITATION AND WIDENING OF FOUR LANES ROAD SECTION BETWEEN DOCKYARD AND MANDELA ROAD AT DAR ES SALAAM PORT NUMBER: PRQ20141633**

On behalf of Tanzania Port Authority (TPA), TradeMark East Africa (TMEA) seeks to contract a consultancy firm to provide Consultancy Services for Supervision of Works and Contract Administration for Rehabilitation and Widening of Four Lanes Road Section between Dockyard and Mandela Road at Dar Es Salaam Port.

The Request for proposal (RFP) document can be obtained at www.trademarkea.com. All queries quoting the above Tender Title and Number in the email subject should be emailed to procurement@trademarkea.com. The closing date for submission is **29th May 2015** no later than 10.00 a.m. Tanzania/ local time.

TRADE MARK EAST AFRICA

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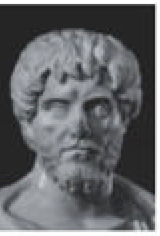

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FMDQ
...empowering the OTC markets

## REQUEST FOR PROPOSAL (RFP) FEASIBILITY STUDY ON THE INTRODUCTION OF OTC DERIVATIVES FOR FMDQ OTC PLC

FMDQ OTC PLC ("FMDQ") is an over-the-counter (OTC) market securities exchange and self-regulatory organisation (SRO) with a mission to empower the financial markets to be innovative and credible, in support of the Nigerian economy. In line with this mission, FMDQ is providing the secondary market with world-class market development and governance services, for the benefit of market participants, and in support of the objectives of the Nigerian financial services regulators.

The Management of FMDQ is seeking proposals from Consultants with significant wealth of experience in financial markets research, to undertake the assignment of carrying out a feasibility study on the introduction of OTC derivatives in FMDQ markets.

Interested Consultants are required to provide information confirming they are qualified to offer the following services:

a. **Conduct feasibility study on the introduction of OTC derivatives in FMDQ markets**
b. **Provide recommendations based on the findings of the study**

Copies of the detailed Request for Proposal (RfP), including a description of the requirements to be provided by respondents and evaluation criteria are available for download on FMDQ's website **http://www.fmdqotc.com/rfp-2/**

Consultants will be shortlisted based on the selection criteria outlined in the RfP.

All proposals from respondents must be submitted by 16:00hrs (GMT +1) on June 12, 2015 to the below named:

**Jumoke Olaniyan**
**Markets and Business Development Division**
**FMDQ OTC PLC**
**1, Olosa Street**
**Victoria Island, Lagos, Nigeria**
**jumoke.olaniyan@fmdqotc.com**

*Only successful respondents shall be contacted.*

TO DOWNLOAD THE DETAILED REQUEST FOR PROPOSAL, VISIT FMDQ'S WEBSITE:
**http://www.fmdqotc.com/rfp-2/**

GLOBAL COMPETITIVENESS    OPERATIONAL EXCELLENCE    LIQUIDITY    DIVERSITY

**FMDQ OTC PLC**
1, Olosa Street, Victoria Island, Lagos, Nigeria

WFP
World Food Programme
wfp.org

## EXPRESSION OF INTEREST Ref. NUMBER HQ15NF166-RFI FOR PROVISION OF CASH-BASED TRANSFER SOLUTIONS

*The United Nations World Food Programme (WFP) is the world's largest humanitarian agency fighting hunger worldwide. Each year, on average, WFP feeds more than 90 million people and it is present in 81 countries. WFP uses food and/or cash-based assistance to address the needs of affected population. In 2014, WFP transferred cash or vouchers to almost 9 million people in 58 countries, continuing the upward trend of market-based approaches within WFP's operations.*

The WFP intends to identify **qualified service providers (including but not limited to Financial Service Providers, Payment Providers and Mobile Service Providers) which are able to provide WFP with a comprehensive solution for Cash-Based Transfers** to fulfil beneficiary's needs in diverse contexts **globally,** considering that WFP operates in contexts with limited infrastructure and connectivity.

The solutions should facilitate easy, secure and electronically traceable cash services and should follow WFP's guiding solution principles: beneficiary centricity, cost efficiency, scalability, security, realisation speed, validity, flexibility, transparency and auditing acceptability. Moreover an improved delivery solution should enable WFP beneficiaries to access their benefits within walking distance from their homes in a secure and efficient manner.

WFP hereby invites interested potential Service Providers to express their interest by completing the Request of Information downloadable with additional information from the following link: **https://www.wfp.org/RFI** and return it not later than **5th June 2015, 17:00 hours (Rome time)**. The received completed questionnaires will be used to pre-qualify potential service providers who will later be invited to participate in a competitive bidding exercise, should one be issued.

# Economic and financial indicators

## Economic data

% change on year ago

| | Gross domestic product | | | Industrial production | Consumer prices | | Unemployment rate, % | Current-account balance | | Budget balance | Interest rates, % | Currency units, per $ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | latest | qtr* | 2015† | latest | latest | 2015† | | latest 12 months, $bn | % of GDP 2015† | % of GDP 2015† | 10-year gov't bonds, latest | May 6th | year ago |
| United States | +3.0 Q1 | +0.2 | +2.6 | +2.0 Mar | -0.1 Mar | +0.3 | 5.5 Mar | -410.6 Q4 | -2.3 | -2.5 | 2.19 | - | - |
| China | +7.0 Q1 | +5.3 | +6.9 | +5.6 Mar | +1.4 Mar | +1.4 | 4.1 Q1§ | +219.7 Q4 | +2.8 | -2.8 | 3.29§§ | 6.20 | 6.23 |
| Japan | -0.8 Q4 | +1.5 | +0.8 | -1.2 Mar | +2.3 Mar | +0.7 | 3.4 Mar | +46.6 Feb | +1.9 | -6.9 | 0.36 | 119 | 102 |
| Britain | +2.4 Q1 | +1.2 | +2.5 | +0.1 Feb | nil Mar | +0.3 | 5.6 Jan†† | -161.3 Q4 | -4.3 | -4.4 | 1.94 | 0.66 | 0.59 |
| Canada | +2.6 Q4 | +2.4 | +2.0 | +1.6 Feb | +1.2 Mar | +1.1 | 6.8 Mar | -39.3 Q4 | -2.7 | -1.8 | 1.82 | 1.20 | 1.09 |
| Euro area | +0.9 Q4 | +1.3 | +1.5 | +1.6 Feb | nil Apr | +0.2 | 11.3 Mar | +298.6 Feb | +2.6 | -2.2 | 0.61 | 0.88 | 0.72 |
| Austria | +0.4 Q1 | +0.7 | +1.0 | -0.2 Feb | +1.0 Mar | +0.9 | 5.6 Mar | +3.2 Q4 | +1.5 | -2.1 | 0.66 | 0.88 | 0.72 |
| Belgium | +0.9 Q1 | +1.2 | +1.2 | -4.6 Feb | +0.3 Apr | +0.2 | 8.5 Mar | +7.4 Dec | +0.6 | -2.6 | 0.83 | 0.88 | 0.72 |
| France | +0.2 Q4 | +0.5 | +1.1 | +0.6 Feb | -0.1 Mar | +0.1 | 10.6 Mar | -18.3 Feb‡ | -0.9 | -4.2 | 0.83 | 0.88 | 0.72 |
| Germany | +1.5 Q4 | +2.8 | +2.0 | -0.3 Feb | +0.4 Apr | +0.4 | 6.4 Apr | +290.1 Feb | +7.5 | +0.7 | 0.61 | 0.88 | 0.72 |
| Greece | +1.2 Q4 | -1.5 | +1.4 | +1.9 Feb | -2.1 Mar | -0.9 | 25.4 Feb | +1.6 Feb | +2.7 | -3.5 | 11.19 | 0.88 | 0.72 |
| Italy | -0.5 Q4 | -0.1 | +0.6 | -0.2 Feb | nil Apr | +0.1 | 13.0 Mar | +45.9 Feb | +1.9 | -2.9 | 1.95 | 0.88 | 0.72 |
| Netherlands | +1.4 Q4 | +3.2 | +1.6 | -0.2 Feb | +0.4 Mar | +0.1 | 8.9 Mar | +90.2 Q4 | +9.3 | -1.9 | 0.61 | 0.88 | 0.72 |
| Spain | +2.6 Q1 | +3.6 | +2.6 | +1.1 Feb | -0.6 Apr | -0.5 | 23.0 Mar | +11.9 Feb | +0.5 | -4.5 | 1.78 | 0.88 | 0.72 |
| Czech Republic | +1.2 Q4 | +1.5 | +2.9 | +4.6 Feb | +0.2 Mar | +0.2 | 7.2 Mar§ | +1.4 Q4 | -0.5 | -1.7 | 0.71 | 24.2 | 19.7 |
| Denmark | +1.5 Q4 | +2.1 | +1.7 | -2.3 Feb | +0.6 Mar | +0.7 | 4.9 Feb | +22.0 Feb | +5.7 | -3.0 | 0.75 | 6.58 | 5.36 |
| Norway | +3.2 Q4 | +3.7 | +0.9 | +2.2 Feb | +2.0 Mar | +1.5 | 4.1 Feb‡‡ | +42.5 Q4 | +11.5 | +6.7 | 1.55 | 7.43 | 5.92 |
| Poland | +3.1 Q4 | +2.8 | +3.3 | +8.7 Mar | -1.5 Mar | +0.2 | 11.7 Mar§ | -5.3 Feb | -1.7 | -1.5 | 2.91 | 3.57 | 3.01 |
| Russia | +0.4 Q4 | na | -4.0 | -0.5 Mar | +16.5 Apr | +15.4 | 5.9 Mar§ | +57.1 Q1 | +4.3 | -2.6 | 10.26 | 49.6 | 35.4 |
| Sweden | +2.6 Q4 | +4.6 | +2.8 | +0.3 Mar | +0.2 Mar | +0.2 | 8.0 Mar§ | +35.7 Q4 | +5.7 | -1.3 | 0.67 | 8.22 | 6.50 |
| Switzerland | +1.9 Q4 | +2.4 | +0.8 | +2.7 Q4 | -0.9 Mar | -0.9 | 3.2 Mar | +49.1 Q4 | +8.0 | +0.3 | 0.11 | 0.92 | 0.87 |
| Turkey | +2.6 Q4 | na | +3.2 | +1.0 Feb | +7.9 Apr | +6.7 | 11.3 Jan§ | -42.8 Feb | -4.6 | -1.7 | 9.45 | 2.69 | 2.09 |
| Australia | +2.5 Q4 | +2.2 | +2.4 | +3.3 Q4 | +1.3 Q1 | +1.7 | 6.2 Apr | -40.1 Q4 | -3.2 | -2.3 | 2.93 | 1.25 | 1.07 |
| Hong Kong | +2.2 Q4 | +1.5 | +2.4 | -3.6 Q4 | +4.6 Mar | +3.3 | 3.3 Mar‡‡ | +5.6 Q4 | +2.3 | -0.2 | 1.72 | 7.75 | 7.75 |
| India | +7.5 Q4 | +4.0 | +7.6 | +5.0 Feb | +5.2 Mar | +5.3 | 8.6 2014 | -27.4 Q4 | -0.9 | -4.1 | 7.89 | 63.6 | 60.0 |
| Indonesia | +4.7 Q1 | na | +5.1 | +2.3 Feb | +6.8 Apr | +5.9 | 5.8 Q1§ | -26.2 Q4 | -3.1 | -1.9 | 7.91 | 13,021 | 11,510 |
| Malaysia | +5.8 Q4 | na | +5.5 | +5.1 Feb | +0.9 Mar | +2.9 | 3.2 Feb§ | +15.2 Q4 | +3.4 | -4.4 | 3.86 | 3.57 | 3.25 |
| Pakistan | +5.4 2014** | na | +5.7 | +0.9 Feb | +2.1 Apr | +4.6 | 6.2 2013 | -1.9 Q1 | -0.6 | -5.1 | 8.85††† | 102 | 98.7 |
| Philippines | +6.9 Q4 | +10.4 | +6.7 | +4.4 Feb | +2.2 Apr | +3.0 | 6.6 Q1§ | +12.7 Dec | +3.8 | -2.0 | 4.46 | 44.5 | 44.3 |
| Singapore | +2.1 Q1 | +1.1 | +3.1 | -5.5 Mar | -0.3 Mar | +0.4 | 1.8 Q1 | +58.8 Q4 | +22.2 | -0.7 | 2.40 | 1.32 | 1.25 |
| South Korea | +2.4 Q1 | +3.1 | +3.1 | -0.1 Mar | +0.4 Apr | +1.1 | 4.0 Mar§ | +97.5 Mar | +6.7 | +0.5 | 2.54 | 1,080 | 1,030 |
| Taiwan | +3.5 Q1 | +4.8 | +3.9 | +6.5 Mar | -0.8 Apr | +0.7 | 3.8 Mar | +65.3 Q4 | +12.6 | -1.2 | 1.60 | 30.6 | 30.2 |
| Thailand | +2.2 Q4 | +7.1 | +3.9 | -1.8 Mar | -1.0 Apr | +1.3 | 1.0 Mar§ | +15.9 Q1 | +2.2 | -1.9 | 2.50 | 33.3 | 32.4 |
| Argentina | +0.4 Q4 | +0.1 | -0.7 | -1.6 Mar | — *** | — | 6.9 Q4§ | -5.1 Q4 | -1.5 | -3.1 | na | 8.94 | 8.00 |
| Brazil | -0.2 Q4 | +1.3 | -1.2 | -3.5 Mar | +8.1 Mar | +8.0 | 6.2 Mar§ | -101.6 Mar | -4.1 | -5.3 | 12.96 | 3.04 | 2.23 |
| Chile | +1.8 Q4 | +3.8 | +3.0 | -3.2 Mar | +4.2 Mar | +3.7 | 6.1 Mar§‡‡ | -3.0 Q4 | -1.5 | -2.0 | 4.49 | 612 | 564 |
| Colombia | +3.5 Q4 | +2.9 | +3.6 | -1.3 Feb | +4.6 Apr | +4.1 | 8.9 Mar§ | -19.8 Q4 | -6.4 | -2.1 | 6.92 | 2,361 | 1,918 |
| Mexico | +2.6 Q4 | +2.7 | +2.8 | +1.6 Feb | +3.1 Mar | +3.2 | 4.2 Mar | -26.5 Q4 | -2.3 | -3.4 | 6.10 | 15.4 | 13.0 |
| Venezuela | -2.3 Q3 | +10.0 | -3.4 | +0.8 Sep | +68.5 Dec | +65.9 | 7.9 Jan§ | +10.3 Q3 | -1.8 | -15.9 | 11.03 | 6.30 | 6.35 |
| Egypt | +4.3 Q4 | na | +4.0 | +4.9 Feb | +11.5 Mar | +9.7 | 12.9 Q4§ | -5.8 Q4 | -1.3 | -10.7 | na | 7.63 | 7.02 |
| Israel | +3.4 Q4 | +7.0 | +3.5 | -0.3 Feb | -1.0 Mar | -0.3 | 5.3 Mar | +9.0 Q4 | +4.8 | -3.0 | 1.75 | 3.85 | 3.45 |
| Saudi Arabia | +3.6 2014 | na | +2.6 | na | +2.0 Mar | +2.7 | 6.0 2014 | +81.2 Q4 | -2.0 | -10.9 | na | 3.75 | 3.75 |
| South Africa | +1.3 Q4 | +4.1 | +2.1 | -0.4 Feb | +4.0 Mar | +4.6 | 24.3 Q4§ | -19.1 Q4 | -5.4 | -3.7 | 8.14 | 12.0 | 10.5 |

Source: Haver Analytics. *% change on previous quarter, annual rate. †*The Economist* poll or Economist Intelligence Unit estimate/forecast. §Not seasonally adjusted. ‡New series. **Year ending June. ††Latest 3 months. ‡‡3-month moving average. §§5-year yield. ***Official number not yet proven to be reliable; The State Street PriceStats Inflation Index, Mar 27.1%; year ago 38.03% †††Dollar-denominated bonds.

## Markets

| | Index May 6th | % change on one week | Dec 31st 2014 in local currency | Dec 31st 2014 in $ terms |
|---|---|---|---|---|
| United States (DJIA) | 17,842.0 | -1.1 | +0.1 | +0.1 |
| China (SSEA) | 4,430.7 | -5.5 | +30.7 | +30.8 |
| Japan (Nikkei 225) | 19,531.6 | -2.6 | +11.9 | +12.4 |
| Britain (FTSE 100) | 6,933.7 | -0.2 | +5.6 | +3.3 |
| Canada (S&P TSX) | 15,023.9 | -2.1 | +2.7 | -0.6 |
| Euro area (FTSE Euro 100) | 1,177.5 | -1.6 | +13.6 | +6.6 |
| Euro area (EURO STOXX 50) | 3,558.0 | -1.6 | +13.1 | +6.1 |
| Austria (ATX) | 2,571.3 | -0.6 | +19.0 | +11.7 |
| Belgium (Bel 20) | 3,589.0 | -3.1 | +9.2 | +2.5 |
| France (CAC 40) | 4,981.6 | -1.1 | +16.6 | +9.4 |
| Germany (DAX)* | 11,350.2 | -0.7 | +15.8 | +8.6 |
| Greece (Athex Comp) | 816.9 | +2.4 | -1.1 | -7.2 |
| Italy (FTSE/MIB) | 22,659.9 | -1.5 | +19.2 | +11.8 |
| Netherlands (AEX) | 478.2 | -2.3 | +12.6 | +5.7 |
| Spain (Madrid SE) | 1,131.7 | -1.9 | +8.6 | +1.9 |
| Czech Republic (PX) | 1,016.7 | -0.8 | +7.4 | +1.8 |
| Denmark (OMXCB) | 847.3 | -1.3 | +25.5 | +17.4 |
| Hungary (BUX) | 22,850.5 | +2.4 | +37.4 | +33.2 |
| Norway (OSEAX) | 701.2 | +2.1 | +13.1 | +14.6 |
| Poland (WIG) | 56,928.6 | +0.7 | +10.7 | +10.5 |
| Russia (RTS, $ terms) | 1,066.2 | +3.3 | +13.2 | +34.8 |
| Sweden (OMXS30) | 1,584.2 | -3.2 | +8.2 | +3.3 |
| Switzerland (SMI) | 8,888.9 | -2.4 | -1.1 | +7.6 |
| Turkey (BIST) | 82,441.3 | -4.1 | -3.8 | -16.6 |
| Australia (All Ord.) | 5,690.9 | -2.2 | +5.6 | +3.0 |
| Hong Kong (Hang Seng) | 27,640.9 | -2.7 | +17.1 | +17.1 |
| India (BSE) | 26,717.4 | -1.9 | -2.8 | -3.5 |
| Indonesia (JSX) | 5,184.9 | +1.6 | -0.8 | -5.8 |
| Malaysia (KLSE) | 1,821.0 | -1.2 | +3.4 | +1.2 |
| Pakistan (KSE) | 33,839.3 | +1.1 | +5.3 | +4.1 |
| Singapore (STI) | 3,459.8 | -0.8 | +2.8 | +3.0 |
| South Korea (KOSPI) | 2,104.6 | -1.8 | +9.9 | +11.8 |
| Taiwan (TWI) | 9,818.2 | -0.4 | +5.5 | +8.9 |
| Thailand (SET) | 1,519.9 | -0.2 | +1.5 | +0.2 |
| Argentina (MERV) | 12,135.3 | -0.4 | +41.5 | +34.3 |
| Brazil (BVSP) | 57,103.1 | +3.2 | +14.2 | nil |
| Chile (IGPA) | 19,912.9 | +1.3 | +5.5 | +5.3 |
| Colombia (IGBC) | 10,949.1 | +1.6 | -5.9 | -5.2 |
| Mexico (IPC) | 44,853.3 | -0.2 | +4.0 | +0.4 |
| Venezuela (IBC) | 5,696.0 | -0.5 | +47.6 | na |
| Egypt (Case 30) | 8,756.3 | +3.2 | -1.9 | -8.1 |
| Israel (TA-100) | 1,416.2 | -1.2 | +9.9 | +10.9 |
| Saudi Arabia (Tadawul) | 9,781.7 | -0.5 | +17.4 | +17.4 |
| South Africa (JSE AS) | 53,848.7 | -1.3 | +8.2 | +4.7 |

## *The Economist* poll of forecasters, May averages (previous month's, if changed)

| | Real GDP, % change: Low/high range 2015 | Low/high range 2016 | Average 2015 | Average 2016 | Consumer prices % change 2015 | 2016 | Current account % of GDP 2015 | 2016 |
|---|---|---|---|---|---|---|---|---|
| Australia | 1.9/2.9 | 2.3/3.2 | 2.4 (2.5) | 2.8 (2.9) | 1.7 | 2.6 (2.7) | -3.2 (-3.0) | -2.9 (-2.5) |
| Brazil | -2.0/-0.5 | 0.7/2.3 | -1.2 (-0.9) | 1.2 | 8.0 (7.6) | 6.0 (5.9) | -4.1 (-3.9) | -3.2 (-3.7) |
| Britain | 2.2/2.8 | 1.9/3.0 | 2.5 (2.6) | 2.5 (2.4) | 0.3 | 1.6 (1.7) | -4.3 (-4.5) | -3.5 (-3.8) |
| Canada | 1.4/2.9 | 1.6/2.8 | 2.0 | 2.2 (2.1) | 1.1 (1.0) | 2.1 | -2.7 (-2.9) | -2.3 (-2.6) |
| China | 6.5/7.3 | 6.5/7.4 | 6.9 | 6.8 (6.7) | 1.4 | 2.0 | 2.8 (2.7) | 2.6 |
| France | 0.9/1.6 | 0.9/2.1 | 1.1 | 1.6 (1.5) | 0.1 | 1.2 (1.1) | -0.9 | -0.8 (-0.7) |
| Germany | 1.6/2.5 | 1.7/3.0 | 2.0 (1.8) | 2.1 (1.9) | 0.4 (0.3) | 1.7 (1.6) | 7.5 (7.6) | 7.1 (7.3) |
| India | 7.2/8.1 | 7.5/8.9 | 7.6 (7.5) | 8.1 (7.9) | 5.3 (5.2) | 5.5 (5.4) | -0.9 | -1.1 (-1.0) |
| Italy | 0.1/0.8 | 0.5/1.7 | 0.6 (0.5) | 1.2 (1.1) | 0.1 | 1.0 | 1.9 | 1.9 |
| Japan | 0.5/1.3 | 1.0/2.1 | 0.8 (1.0) | 1.5 (1.7) | 0.7 | 1.1 | 1.9 (2.3) | 2.3 (2.4) |
| Russia | -5.0/-2.7 | -1.8/2.0 | -4.0 (-4.1) | 0.4 (0.2) | 15.4 (15.2) | 6.9 | 4.3 (3.7) | 4.6 (3.9) |
| Spain | 2.3/3.0 | 2.0/3.0 | 2.6 (2.4) | 2.4 (2.2) | -0.5 (-0.6) | 1.0 (1.1) | 0.5 (0.4) | 0.5 (0.4) |
| United States | 2.3/3.2 | 2.5/3.0 | 2.6 (3.0) | 2.8 | 0.3 | 2.1 | -2.3 (-2.2) | -2.5 (-2.3) |
| Euro area | 1.2/1.8 | 1.3/2.5 | 1.5 (1.4) | 1.9 (1.7) | 0.2 (0.1) | 1.3 (1.2) | 2.6 (2.7) | 2.5 (2.6) |

Sources: Bank of America, Barclays, BNP Paribas, Citigroup, Commerzbank, Credit Suisse, Decision Economics, Deutsche Bank, EIU, Goldman Sachs, HSBC Securities, ING, Itaú BBA, JPMorgan, Morgan Stanley, Nomura, RBS, Royal Bank of Canada, Schroders, Scotia Capital, Société Générale, Standard Chartered, UBS. For more countries, go to: Economist.com/markets

## Other markets

| | Index May 6th | % change on one week | Dec 31st 2014 in local currency | Dec 31st 2014 in $ terms |
|---|---|---|---|---|
| United States (S&P 500) | 2,080.2 | -1.3 | +1.0 | +1.0 |
| United States (NAScomp) | 4,919.6 | -2.1 | +3.9 | +3.9 |
| China (SSEB, $ terms) | 400.5 | -0.3 | +37.7 | +37.8 |
| Japan (Topix) | 1,585.6 | -2.6 | +12.7 | +13.1 |
| Europe (FTSEurofirst 300) | 1,547.7 | -2.2 | +13.1 | +6.1 |
| World, dev'd (MSCI) | 1,772.8 | -1.3 | +3.7 | +3.7 |
| Emerging markets (MSCI) | 1,040.4 | -1.8 | +8.8 | +8.8 |
| World, all (MSCI) | 434.7 | -1.3 | +4.2 | +4.2 |
| World bonds (Citigroup) | 883.1 | -0.9 | -2.1 | -2.1 |
| EMBI+ (JPMorgan) | 712.5 | -0.7 | +3.0 | +3.0 |
| Hedge funds (HFRX) | 1,244.6§ | -0.6 | +2.1 | +2.1 |
| Volatility, US (VIX) | 15.2 | +13.4 | +19.2 | (levels) |
| CDSs, Eur (iTRAXX)† | 63.0 | +2.9 | -2.7 | -8.7 |
| CDSs, N Am (CDX)† | 65.4 | +4.3 | -5.1 | -5.1 |
| Carbon trading (EU ETS) € | 7.6 | +1.2 | +3.8 | -2.6 |

Sources: Markit; Thomson Reuters. *Total return index. †Credit-default-swap spreads, basis points. §May 5th.

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## *The Economist* commodity-price index

2005=100

| | Apr 28th | May 5th* | % change on one month | % change on one year |
|---|---|---|---|---|
| **Dollar Index** | | | | |
| All Items | 143.1 | 145.5 | +1.6 | -17.2 |
| Food | 156.9 | 157.5 | -1.7 | -23.7 |
| Industrials | | | | |
| All | 128.8 | 133.0 | +5.8 | -7.6 |
| Nfa† | 121.5 | 123.5 | +2.9 | -18.0 |
| Metals | 131.9 | 137.0 | +7.0 | -2.9 |
| **Sterling Index** | | | | |
| All items | 169.9 | 174.2 | -0.5 | -7.4 |
| **Euro Index** | | | | |
| All items | 162.1 | 161.7 | -1.4 | +3.1 |
| **Gold** | | | | |
| $ per oz | 1,212.3 | 1,196.1 | -1.4 | -8.5 |
| **West Texas Intermediate** | | | | |
| $ per barrel | 56.1 | 60.5 | +12.4 | -39.4 |

Sources: Bloomberg; CME Group; Cotlook; Darmenn & Curl; FT; ICCO; ICO; ISO; Live Rice Index; LME; NZ Wool Services; Thompson Lloyd & Ewart; Thomson Reuters; Urner Barry; WSJ. *Provisional †Non-food agriculturals.

# The great survivor

**Wladyslaw Bartoszewski, a Polish statesman, died on April 24th, aged 93**

WHEN Hitler's forces marched into Warsaw in September 1939, Wladyslaw Bartoszewski's parents told him not to panic. They had experienced German occupation during the last war. There would be inconvenience, disorder and even looting. He should be careful. But it would not be too bad—the Germans were, after all, west Europeans—and by next year, the British and French would arrive.

The Bartoszewskis could hardly have given their teenage son worse advice. The Western allies never came; instead the Soviets joined in the Nazi attack. Hitler not only wiped Poland off the map, but aimed to obliterate its language, culture and people. Wladyslaw, caught in a random round-up, was sent to Auschwitz.

He would have died there, but exceptionally his employer, the Polish Red Cross, managed to get him out by 1941. Freed, he wrote down the first account of the place. When a little girl on the train home offered him some bread and cheese, it was the first touch of humanity since his arrest.

He showed that kindness to Poland's Jews. Through Zegota, a part of the Polish underground state set up for the purpose, he helped provide them with food, shelter, medical care and, during the doomed Warsaw ghetto uprising in 1943, arms. All this was punished by death, but Mr Bartoszewski—Zegota's last survivor—scoffed at the idea that it was romantic or heroic. Those involved would have thought such talk "crazy". He, and they, simply believed that Hitler should not dictate what was right or wrong. His lifelong motto was "Be decent". It didn't always pay, but it was always worth it; whereas bad behaviour often paid off, but wasn't worth it.

Many years later he would become "Righteous among Nations" at the Yad Vashem memorial in Israel. But like many valiant Poles, his post-war fate was persecution. Prison under the new communist authorities was no better than Auschwitz, he recalled grimly.

Post-Stalinist Poland was mostly boring and tiresome rather than horrible. A born optimist, he refused to be cast down. Like many intellectuals, he spent decades in a grey zone of half-tolerated writing and lecturing. He was allowed to travel (his son went to Oxford), and was published widely abroad, though he was jailed again under martial law in 1981, when he relished giving survival tips to his less hardened cell-mates. The war truly ended only in 1989, he said, when Poland regained its freedom and his life began anew.

His excellent German made him a natural choice to be the new government's ambassador to Austria, and he served twice as foreign minister. He walked faster than his bodyguards, and talked faster than anyone; his machinegun delivery earned him the not wholly affectionate nickname of "Uzi". But his moral stature, matched only by his physical height, helped him pioneer two great reconciliations. One was with Israel, where Polish pre-war anti-Semitism was often, unfairly, seen as part and parcel of the incomparably greater crime of German mass murder of Jews on the occupied country's soil. Ever alert to crass national stereotyping, he also firmly rebutted the Polish association of Jews with communist torment: most Jews opposed Soviet rule and suffered under it, he insisted.

The other reconciliation was with Germany, seen by many Poles as the country's ultimate enemy. He never conflated the Germans, whose language and culture he loved, and the Hitlerites. When Nazi goons searched his home he teasingly quoted Heine—a German-Jewish poet whose popular "Die Loreley" was allowed by the Nazis under the pretext that it was an anonymous folk song. In occupied, despoiled Warsaw, the opening lines were apt.

> I know not if there is a reason
> Why I am so sad at heart.
> A legend of bygone ages
> Haunts me and will not depart.

Post-war Germans, unlike Russians, were in general sorry for what they had done, he insisted. As a Catholic it was his duty to forgive. Those he saw as unrepentant were another matter. His great ire was against Erika Steinbach, a combative leader of Germans cruelly deported from Poland after the war. But she was an exception. "We Poles should not be so bold as to think that we know the Germans' thinking better than they do," he said. Far more worrying was the revanchism of Vladimir Putin—a much cleverer man than many Western politicians thought, he said.

**A prophet honoured**

His popularity was greatest abroad. He was contemptuous of the neuroses and conspiracy theories of post-1989 Poland: that the country was still run by communist-era spooks (with the implication that people like him were their puppets); or that a plot caused the calamitous crash of the presidential plane in Russia in 2010. Though he belonged to no party, he was an adviser to many centrist politicians—providing counsel with unstoppable volubility well into old age.

The war, stints in jail and persecution meant he had no formal higher education. Though he was a sought-after lecturer on history, and author of dozens of books, in status-conscious Poland some begrudged him the self-awarded title of "Professor". But most thought he had earned it, and a lot more besides. ■