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A SPECIAL REPORT ON THE OIL INDUSTRY

Italy's high-stakes referendum

The faddishness of economics

Exposing exoplanets

The burning question

Climate change in the Trump era

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Politics

Angela Merkel announced that she will run for a fourth term as chancellor of **Germany** next year. Many liberals were delighted, especially foreign ones. Within Germany there was joy among right-wing populists, who relish the chance to run against the chancellor, whom they blame for allowing large numbers of refugees into the country. A possible challenger, Martin Schulz, decided to leave his job as president of the European Parliament. He may run against Mrs Merkel as the candidate of the opposition Social Democrats.

François Fillon, a former prime minister, unexpectedly won the first round of the Republican party primaries in **France**, with 44% of the vote. He is favoured to win the second round, and could claim the presidency next year if he is pitted against Marine Le Pen, the leader of the far-right National Front. Yet polls in France, as elsewhere, have been poor guides lately.

The chances that Matteo Renzi, **Italy's** prime minister, will win the controversial referendum on constitutional reforms scheduled for December 4th look ever more shaky. Silvio Berlusconi, a former prime minister, and Beppe Grillo, a populist politician, have said they will vote No.

Turkey's ruling Justice and Development party withdrew a bill that would have pardoned men for having sex with underage girls if they married them. The bill had sparked protests in Turkey and abroad.

In **Britain** Philip Hammond, the chancellor of the exchequer, gave the government's first detailed budget announcement since the Brexit vote in June. He confirmed forecasts of reduced GDP growth over the next two years. Net government borrowing, which in the March budget was expected to move into surplus in 2019, was projected to stay in deficit for at least the next five years.

Thomas Mair was given a life sentence for the murder of **Jo Cox**, a Labour MP, the first killing of an MP not carried out by Irish nationalists for two centuries. She was shot and stabbed a week before the Brexit vote in June. Mr Mair suffered from mental illness for years and had connections with British nationalist and neo-Nazi groups.

Water pressure

Bolivia declared a state of emergency to help fight the effects of its worst drought in 25 years. Eight of the country's nine departments have water shortages. In La Paz, the seat of the national government, many houses have been cut off from water for days at a time and people are queuing to fill buckets from tankers that come sporadically.

A court in New York convicted two nephews of **Venezuela's** First Lady, Cilia Flores, of conspiring to bring cocaine into America. They were caught in Haiti in 2015 in a sting operation led by America's Drug Enforcement Administration.

The World Health Organisation's decision to declare an end to the global health emergency over the **Zika virus** was criticised by some for sending the wrong signal. The WHO said the mosquito-borne disease is still a crisis, but efforts should now go into stopping its spread over the long-term.

The danger line

Indian and **Pakistani** forces exchanged fire along the Line of Control in the disputed state of Kashmir. India blamed Pakistan for the killing of three soldiers. Pakistan said retaliatory shelling by India had killed three of its soldiers and ten civilians.

South Korea approved a controversial intelligence-sharing pact with Japan. Separately, prosecutors named Park Geun-hye, the president, as a suspect in an influence-peddling scandal.

Rodrigo Duterte, the president of the **Philippines**, said he would declare a marine sanctuary within the lagoon of Scarborough Shoal, a disputed tidal atoll in the South China Sea, neatly sidestepping the question of whether China would allow access to Filipino fishermen.

Promises on paper

Zimbabwe's central bank said it would soon start issuing "bond notes" to ease a shortage of currency. The notes will be the first printed by Zimbabwe since it abandoned its currency in 2009 for American dollars during a bout of hyperinflation. The new notes are ostensibly backed by $200m held by the central bank.

A contingent of **Japanese** peacekeepers arrived in **South Sudan**. It is Japan's first deployment of troops with a mandate allowing them to use deadly force for anything other than strict self-defence. The new rules allow the troops to come to the aid of UN staff and NGO workers.

More than 100 people were arrested and one killed in **Cameroon** amid protests in English-speaking parts of the country against the use of French in courts and schools.

The Syrian government rejected a UN proposal that would leave eastern **Aleppo** under the control of the opposition, if the opposition agreed to withdraw fighters from that part of the city.

Shia militias in Iraq claimed to have taken control of a key road west of **Mosul**, Islamic State's last redoubt. If true, that would mean the city is now encircled.

All Trump, all the time

Donald Trump made more appointments to his incoming administration. Mike Pompeo, a congressman on the House intelligence committee, was named director of the CIA. Mike Flynn, a retired general, becomes national security adviser. And Jeff Sessions, a senator, was picked for attorney-general. All three are on the hard right of the Republican Party. But Mr Trump surprised his critics by selecting Nikki Haley, a relatively moderate governor, as America's ambassador to the UN.

Meanwhile, Mr Trump agreed to pay $25m to settle fraud allegations surrounding **Trump University**. The deal stops a trial from being held.

The president-elect also gave an interview to the *New York Times*. Mr Trump deplored the rise of the **"alt-right"**, a loose collection of far-right groups that supported his campaign, acknowledged there was "some connectivity" for man's role in climate change and said he would not prosecute Hillary Clinton over her e-mails. Some of his supporters were unhappy, displaying their resentment on placards with "Hillary's lies matter".

Business

Stockmarkets in America remained buoyant as investors anticipated that Donald Trump's presidency will reduce regulations and boost growth. The Dow Jones Industrial Average, S&P 500 and NASDAQ share indices rose to new record highs on the same day, with the Dow closing above the 19,000 mark for the first time. Investors also focused on whether OPEC members will agree to cut oil production, and thus lift **oil prices** (and oil-industry profits), at their forthcoming meeting.

Risk monitor

An annual ranking of **systemically important global banks** was published by the Financial Stability Board, an international regulatory body. It ranks 30 banks based on the risk they would present to the world economy if they went bankrupt. JPMorgan Chase topped the list again and was joined by Citigroup, which moved up a notch in the rankings' tier structure. Bank of America, Wells Fargo and Industrial and Commercial Bank of China were also deemed to pose a greater risk than they did last year; HSBC, Barclays and Morgan Stanley a smaller one.

Fosun, a Chinese conglomerate, bought a 17% stake in **Millennium BCP**, making it the largest shareholder in Portugal's biggest listed bank. Fosun already owns Portugal's biggest insurance company.

The board at **TransAsia Airways**, a Taiwanese airline, decided to shut down the business. Its passenger numbers have fallen over the past two years after two fatal crashes raised concerns about safety. Traffic from China has also waned following the victory of the pro-nationalist party in Taiwan's presidential election, which has soured cross-strait relations.

After more than a year of bad publicity following its admission that it cheated in emissions tests, **Volkswagen** produced a new strategic plan, which includes permanently withdrawing the diesel cars that were at the centre of the scandal from sale in the United States. The American market is central to VW's strategy as it makes a big push into sports-utility vehicles and electric cars, which it will build in America from 2021. The carmaker recently reached an agreement with unions to shed 30,000 jobs worldwide.

India's central bank said that \$80bn-worth of 500- and 1,000-rupee banknotes had been handed in to banks since the government's decision to withdraw them from circulation in an effort to clamp down on tax evasion. The notes are no longer legal tender, but can be deposited in bank accounts until the end of the year. The move to take them out of circulation was unexpected. It is thought the disruption to the cash-based economy could knock up to one percentage point off India's growth rate.

Brazil's finance ministry lowered its forecast for growth next year to 1%, from the 1.6% it had previously projected. The economy is struggling to pull away from recession. The expanding budget deficit is also a concern. This week the president of the central bank, Ilan Goldfajn, said that trying to inflate the debt away is "no longer an option" and he called for "laws of fiscal adjustments" that would reduce public spending.

A blow to sufferers

Eli Lilly said that a clinical trial for a new drug to slow the onset of **Alzheimer's** had failed. The drug, solanezumab, was tested on patients with mild cases of Alzheimer's, who showed only a slight improvement after 18 months of treatment. The experiment had been closely watched by medical researchers and hopes were high that solanezumab would be the first drug approved to treat the disease.

A judge in Texas issued a nationwide injunction stopping a measure that would have extended **overtime pay** to millions of lower-paid workers and that had been due to come into effect on December 1st. The measure was opposed by business groups, which argued it would increase costs and cause them to cut staff hours. The judge decided that the Obama administration had overstepped its authority.

Sunoco Logistics and **Energy Transfer Partners**, two closely intertwined pipeline companies, agreed to merge in a \$21bn deal. Energy Transfer built the Dakota Access oil pipeline, which will carry crude from the Bakken shale field in North Dakota to Illinois. The pipeline crosses Sioux tribal land and has sparked fierce protests (police recently used water cannon on hundreds of demonstrators). The election of Donald Trump is expected to smooth final consent for the project.

Getting away from it all

Around 48.7m Americans are expected to travel over **Thanksgiving**, the most since 2007, according to the AAA, a motoring organisation. With family get-togethers uppermost in the mind, the most popular destination for travellers is, naturally, Las Vegas.

Other economic data and news can be found on pages 80-81

The burning question

With or without America, self-interest will sustain the fight against global warming

BLOWING hot and cold doesn't begin to cover it. In 2009 Donald Trump signed a public letter calling for cuts to America's greenhouse-gas emissions. In 2012 he dismissed climate change as a hoax cooked up by the Chinese. On the campaign trail he promised to withdraw from an international accord, struck last year in Paris, to fight global warming. This week, as president-elect, Mr Trump said he has an "open mind" on the Paris deal and that there is "some connectivity" between human activity and climate change.

Such fickleness gives succour to pessimists and optimists alike. Those who are gloomy about the climate still expect America to ignore or withdraw from the Paris agreement, or to abandon the 1992 UN framework that underpins it. Sunnier folk hope that Mr Trump will govern differently from how he campaigned, enabling the fight against climate change to continue unabated. The reality is more complex. Mr Trump's brand of "America First" populism will do nothing to help the planet, but neither need it be the catastrophe many fear.

Hot air

First, the bad news. Even if Mr Trump honours America's commitment to the Paris accord, it is unlikely that his administration will galvanise action. Many in the Republican establishment think that climate deals are examples of global regulatory over-reach. Plenty of Mr Trump's voters dismiss climate change itself as a phoney fad peddled by "bicoastal elites". Fossil fuels stand for prosperity and freedom—from the romance of the roughneck to the lure of the road. Sure enough, on November 21st Mr Trump pledged that on day one of his administration he would scrap "job-killing restrictions" on the production of American fossil fuels, which account for 80% of America's man-made greenhouse-gas emissions.

The rhetoric is not the only thing that will be markedly different. The main practical way a Trump administration is likely to weaken the Paris agreement is by avoiding America's commitments to pay large sums to help other countries cope with climate change. The burden of fighting global warming falls less on rich countries, where energy demand is stagnant and efficiency is rising, than on poor ones, where billions still lack the cheap energy fossil fuels can provide. Poor countries were won over partly by the $100bn a year that America and others promised to help them cope. Private investors were always going to have to stump up lots of cash to fund climate-change action; the onus on them will be heavier.

This is worrying. But, on close inspection, the path to a greener future still remains open, both in America and abroad. At home there are limits to what Mr Trump's embrace of fossil fuels can achieve. For all the trillions of dollars-worth of oil and gas that he hopes will be fracked on federal lands, no one will sink a well unless it is profitable to do so. That needs oil prices to be substantially higher than they are now. Coal, too, has been displaced by cheap shale gas rather than Barack Obama's regulations. Even if the new administration abandons America's Paris pledges, California has its own clean-energy mandate and will continue to set fuel-efficiency standards that other states and the car industry follow. Besides, energy investments last for decades—firms may well be loth to bet that future presidents will stick with Mr Trump's policies.

Nor need the fight against climate change elsewhere founder in the absence of American leadership. Self-interest will see to that (see page 51). China takes air pollution in its cities at least as seriously as it does climate change—a recent study found that air pollution contributed to the deaths of 1.6m people in China each year. Switching from burning coal to cleaner forms of energy thus makes sense twice over. India needs climate action as insurance against extreme weather: it spends a fortune in the wake of storms, floods and other events.

Commercial self-interest will also keep other countries on the path towards decarbonisation. The costs of clean energy are tumbling. The cost of batteries in electric vehicles has fallen by 80% since 2008; the bill for offshore-wind energy has more than halved over the past three years in northern Europe. Solar power is closing in on gas and coal as an attractively cheap source of power. China plans to have nearly 150 gigawatts of installed solar capacity by the end of the decade, triple what it has today as the world's biggest solar generator.

As this week's special report points out, such developments will curb demand for oil and coal in decades to come. Last year was the first in which renewable energy surpassed coal as the world's biggest source of power-generating capacity (although natural gas will remain an important complement to renewables because of the vagaries of sun and wind). These are epochal changes, with moneymaking opportunities to match. China, for instance, hopes to become a clean-energy superpower by producing cheaper panels, turbines, batteries and electric cars, as well as the systems that link them all together.

Don't COP out

To be clear, there is much to regret in the prospect of America relinquishing its leadership on fighting climate change. The idea of the world's second-biggest polluter free-riding on the efforts of others has some countries mulling counter-attacks—one proposal, a carbon tariff on American exports, could lead to a damaging trade war. The Paris agreement was always likely to fall far short of its goal of limiting global warming to within 2°C of pre-industrial temperatures. A more recalcitrant America puts the prospect of deep decarbonisation even further off. And evidence that Mr Trump's America is withdrawing from its global role is worrying.

Yet with climate change, as with other areas that have come to depend on American leadership, the rest of the world can make the best of a bad situation by staying the course. China's carbon emissions may already have peaked. Improvements in cars' fuel efficiency cut oil consumption by 2.3m barrels a day in 2015, even when petrol was cheap. China, India, the European Union, Canada and others have strong incentives to embrace cleaner technologies. If they work together they can make a difference—with or without the United States. ■

1MDB

Falling down

Malaysians underestimate the trouble their country is in

FORTY thousand people wearing yellow shirts gathered in Malaysia's capital on November 19th, to protest against corruption and impunity in government. The rally was orderly and restrained; the response of the authorities was not. On the eve of the protest, police arrested Maria Chin Abdullah, leader of a coalition of human-rights groups that organised the event. She was placed in solitary confinement, and can be held there for 28 days. Even by Malaysia's dismal recent standards this marked a fresh low. Ordinary Malaysians should not stand by while their leaders undermine the rule of law so casually.

Ms Chin Abdullah's detention was justified by an anti-terrorism law which the government had promised would never be used against political opponents. The true motivation was to stifle outrage over 1MDB, a state-owned investment firm from which billions have gone missing. In July American government investigators said they thought that $3.5bn had been taken from the firm and that hundreds of millions of dollars went to the prime minister, Najib Razak (who says he has never taken public funds for personal gain). The investigators' findings corroborated exposés written by local and foreign journalists, who have been unravelling the saga for several years.

Elsewhere the scandal would have sparked a swift change in government. But the United Malays National Organisation (UMNO) has held power for six decades and enjoys broad support from Malaysia's ethnic-Malay majority, some of whom resent their ethnic-Chinese and Indian compatriots. The party has devised many ways to protect its leaders from internal revolts, so Mr Najib found it easy to purge critics, delay a parliamentary investigation and replace an attorney-general said to have been preparing charges against him.

No one in Malaysia has been charged over 1MDB's missing money. But a court has handed a prison sentence to an opposition politician who frustrated efforts to hush up the affair. The editor and publisher of one of Malaysia's last independent news organisations face jail under a rule which forbids certain content published with "intent to annoy". A competitor closed in March after authorities ordered its website blocked.

Mr Najib's party is carelessly widening Malaysia's ethnic and religious splits. Seeking to bolster support among conservative Malay Muslims, it is toying with a proposal to intensify the whippings which may be meted out by *sharia* courts. It has failed properly to condemn pro-government gangs that last year menacingly gathered in a Chinese part of the capital. Their leaders paint ethnic Malays as victims of sinister conspiracies—dangerous rumour-mongering in a country where politics is still defined by the racial violence of the 1960s.

Easily broken, hard to fix

Until now foreign investors have been fairly sanguine about the economy. But they are growing rattled. The ringgit has depreciated faster than other emerging-market currencies (see page 64). Last week the authorities asked foreign banks to stop some ringgit trading abroad, raising fears of harsher controls.

Rural ethnic Malays, a crucial constituency, feel that the scandal is a remote affair. Even some educated urbanites still favour Mr Najib's government over the opposition, underestimating the damage being done by the scandal. If change is to come, the disparate opposition needs to do a better job of winning such people over; its fractious parties must overcome their divisions and present a plausible candidate to replace Mr Najib in a general election that could be held as soon as next year. Malaysia has always been an imperfect democracy, but the rot eating at its institutions is harming its international standing and its economic prospects alike. ■

American politics

The hardest deal

Donald Trump should put his business at arm's length—for the sake of his presidency and his bottom line

WHEN Americans elected a businessman as president they created a problem: the risk of conflicts between his business interests and his political role. Already, red lights are flashing. China has just resolved a long-standing legal dispute in Mr Trump's favour. A developer in India has been marketing a new Trump-branded 75-storey skyscraper under the slogan: "Congratulations Mr President-Elect".

The danger of the White House becoming a subsidiary of the Trump Organisation is real. Some are demanding that Mr Trump liquidate his business. Mr Trump's allies say he can do what he likes under the law. Both sides want to shred the conventions governing the Oval Office. Instead, Mr Trump should be treated like every American president. He must ring-fence his private interests and put them under independent supervision. It is the only fix that is both principled and practical. If Mr Trump wants to govern without being dogged by second-guessing about how his businesses are contaminating his policies, it is in his own interests, too.

America is not about to become Ukraine or Russia, where politicians own the commanding heights of the economy. The Trump Organisation is too small and parochial for that (see page 55). About 70% of its value resides in ten domestic proper- ▸▸

ties. Worth some $4bn, it would be America's 833rd-largest firm if it was listed. But it is easy to see how abuses might occur given the slipperiness of Mr Trump and his attempts to franchise his brand abroad. He might take decisions about rules that help his firm, or give perks to those he wants to do deals with. Officials, rivals and foreign governments might treat the company differently so as to curry favour with the president.

The law is frustratingly silent on how to avoid such dangers. The president and vice-president are exempt from laws stopping members of the executive from directly owning firms. Mr Trump's proposed solution is to pass control to his three eldest children—Donald, Ivanka and Eric. But they do not enjoy separate business identities from their father, having always been subordinate to him. They have also been involved in his campaign and preparations for the White House. To pass them the keys to the organisation would not create sufficient distance between the president and his business affairs.

An alternative is for Mr Trump to liquidate his assets. But that is impractical. His inauguration is less than 60 days away. To prepare an initial public offering for a well-run firm takes a year. Given its poor disclosure, obscure legal structure and lack of professional management, no reputable investor would buy the Trump Organisation outright. Some of its best properties could be sold quickly, but the dross might take years to offload. The precedent set by a liquidation would also be bad for America, because it would mean that anyone who had built a company would be less likely to run for high office.

The best solution is for Mr Trump to follow precedent and put his assets at arm's length. The business should also be transparent to Congress and the public. Three steps are required. First, the firm must aggregate its legal entities under one holding company and publish consolidated accounts that capture its entire scope of activity. Second, an independent board of directors must be appointed, and it must appoint an external chief executive. Lastly, this board must be given a mandate that allows it to sell, but not buy, assets; and that requires it to distribute all profits as dividends and to refrain from new foreign investments. The effect would be to turn the Trump Organisation into a mature portfolio of domestic property assets which generate rental payments for the Trumps.

Don't blemish the brand

If ethical concerns do not persuade Mr Trump, commercial and political ones might. Already some worry that he may breach a clause in the constitution designed to prevent foreign countries from buying influence. If his conflicts led to disgrace, it would deter reputable firms from doing business with the Trump Organisation. High politics, hard cash and close families can be a toxic mix for voters, as the Clintons found after Bill Clinton made $49m from speeches while his wife was secretary of state. This week Mr Trump said he would "like to do something" to deal with conflicts of interest. Ring-fencing his business and ceding control to independent overseers would do the job. ■

Italy's constitutional reforms

A regretful No

If he wants to fix Italy's chronic crisis, Matteo Renzi is arguing for the wrong reforms

ITALY has long been the biggest threat to the survival of the euro, and the European Union. Its GDP per head is stuck at the level of the late 1990s. Its labour market is sclerotic. Its banks are stuffed with non-performing loans. The state is burdened with the second-highest debt load in the euro zone, at 133% of GDP. If Italy veers towards default, it will be too big to rescue.

That is why so much hope has rested with Matteo Renzi, the young prime minister. He thinks Italy's biggest underlying problem is institutional paralysis, and has called a referendum for December 4th on constitutional changes that would take back powers from the regions and make the Senate subordinate to parliament's lower house, the Chamber of Deputies. This, together with a new electoral law that seeks to guarantee the biggest party a majority, will give him the power to pass the reforms Italy desperately needs, or so he claims.

If the referendum fails, Mr Renzi says he will step down. Investors, and many European governments, fear a No vote will turn Italy into the "third domino" in a toppling international order, after Brexit and the election of Donald Trump. Yet this newspaper believes that No is how Italians should vote.

Mr Renzi's constitutional amendment fails to deal with the main problem, which is Italy's unwillingness to reform. And any secondary benefits are outweighed by drawbacks—above all the risk that, in seeking to halt the instability that has given Italy 65 governments since 1945, it creates an elected strongman. This in the country that produced Benito Mussolini and Silvio Berlusconi and is worryingly vulnerable to populism.

Granted, the peculiar Italian system of "perfect bicameralism", in which both houses of parliament have the exact same powers, is a recipe for gridlock. Laws can bounce back and forth between the two for decades. The reforms would shrink the Senate, and reduce it to an advisory role on most laws, like upper houses in Germany, Spain and Britain.

In itself, that sounds sensible. However, the details of Mr Renzi's design offend against democratic principles. To begin with, the Senate would not be elected. Instead, most of its members would be picked from regional lawmakers and mayors by regional assemblies. Regions and municipalities are the most corrupt layers of government, and senators would enjoy immunity from prosecution. That could make the Senate a magnet for Italy's seediest politicians.

At the same time, Mr Renzi has passed an electoral law for the Chamber that gives immense power to whichever party wins a plurality in the lower house. Using various electoral gimmicks, it guarantees that the largest party will command 54% of the seats. The next prime minister would therefore have an almost guaranteed mandate for five years.

That might make sense, except for the fact that the struggle to pass laws is not Italy's biggest problem. Important measures, such as the electoral reform, for example, can be voted through today. Indeed, Italy's legislature passes laws as much as those of other European countries do. If executive power were the answer, France would be thriving: it has a powerful presidential system, yet it, like Italy, is perennially resistant to reform.

The risk of Mr Renzi's scheme is that the main beneficiary will be Beppe Grillo, a former comedian and leader of the Five Star Movement (M5S), a discombobulated coalition that calls for a referendum on leaving the euro. It is running just a few points behind Mr Renzi's Democrats in the polls and recently won control of Rome and Turin. The spectre of Mr Grillo as prime minister, elected by a minority and cemented into office by Mr Renzi's reforms, is one many Italians—and much of Europe—will find troubling.

One drawback of a No vote would be to reinforce the belief that Italy lacks the capacity ever to address its manifold, crippling problems. But it is Mr Renzi who has created the crisis by staking the future of his government on the wrong test (see pages 20-22). Italians should not be blackmailed. Mr Renzi would have been better off arguing for more structural reforms on everything from reforming the slothful judiciary to improving the ponderous education system. Mr Renzi has already wasted nearly two years on constitutional tinkering. The sooner Italy gets back to real reform, the better for Europe.

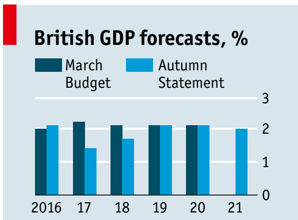
Weak foundations

What, then, of the risk of disaster should the referendum fail? Mr Renzi's resignation may not be the catastrophe many in Europe fear. Italy could cobble together a technocratic caretaker government, as it has many times in the past. If, though, a lost referendum really were to trigger the collapse of the euro, then it would be a sign that the single currency was so fragile that its destruction was only a matter of time. ■

Britain's economy

Limited ambition

The government's muddled approach to Brexit ties the chancellor's hands



OVER the past five months Theresa May has shown a fondness for bold words and grand promises. On the steps of Downing Street on her first day in office, the prime minister promised to "make Britain a country that works for everyone". At the Conservative Party conference in October she excoriated those who consider themselves "citizens of the world", arguing that "a change has got to come". Earlier this month she recast herself as a champion of globalisation, but pledged a "new approach" to managing its forces.

November 23rd marked the first big opportunity to turn this fighting grandiloquence into action, as Philip Hammond, the chancellor of the exchequer, made his Autumn Statement, an annual mini-budget. Yet the first big fiscal event since the referendum was modest and boring, the mirror image of the prime minister's fierce rhetoric.

Some of that blandness was welcome. Mr Hammond sensibly steered clear of the fiscal gimmicks and surprises so beloved of his predecessor, George Osborne. He slowed the pace of fiscal tightening and said lots of reasonable things about boosting productivity by increasing public investment in infrastructure, encouraging innovation and building houses (see page 47). He offered some help for hard-up Britons by easing the pace of an excessively draconian squeeze of welfare. But in each case the scale of his ambition was resolutely small.

To deal with the gulf between Britain and some other rich countries, Mr Hammond proposed a "National Productivity Investment Fund"—but with a budget of less than £5bn ($6.2bn) a year it is not a game-changer. Laudable promises to help households that are only "just about managing" amounted chiefly to a very slight easing in the rate at which benefits taper away as their income rises. He confirmed an increase in the tax-free threshold—but that will mainly help the better-off. An accompanying rise in the threshold for higher-rate taxpayers is also a giveaway to the relatively rich.

In this epitome of cautious budgeting, "Spreadsheet Phil", as the chancellor is known, lived up to his reputation. The problem lies in the size of the gap between his modest ambitions and his boss's grand promises—and the reasons behind it.

One cause is the sheer lack of spare money. The Autumn Statement produced the first official projections for the public finances since the referendum. The government's independent forecaster now predicts that, over the five years from 2016 to 2021, the economy will grow by 2.4 percentage points less than had been expected before the Brexit vote. It sees the public finances deteriorating sharply, leaving the government borrowing £122bn more than planned. Bigger deficits and more debt limits the scope to rewrite Britain's social contract.

A second, related problem is that fiscal policy is constrained by the lack of clarity over what kind of Brexit Britain is heading for. The official forecasts assume that in 2019, the earliest that Britain will leave the EU, the economy will grow at the same rate as was predicted before the referendum. Yet if the country leaves the EU's single market, which buys nearly half its exports, that seems optimistic. Until the government lays down the outlines of what Britain hopes to achieve from Brexit—and debates the strategy in Parliament—the chancellor's fiscal plans cannot be anything other than limited and uncertain.

Maybe there is no plan

The third and most worrying explanation for the dissonance is the suspicion that Mrs May's bold rhetoric masks her lack of a coherent policy. She champions free trade, while being noncommital about Britain's membership of the world's biggest market. She defends globalisation, while promising to cut migration to Britain by two-thirds. She acknowledges the importance of getting a transitional deal after Brexit, only for her spokesperson to deny that any such deal is a negotiating aim.

The lack of clarity about the government's thinking on Brexit is billed as a canny negotiating ploy. The growing fear is that it may in fact be a sign that the prime minister has no plans to match her words. If so, a bland budget filled with uncertainty was the best that Britain could have hoped for. ■

Turkish politics

"Turkey locks up dissidents" (November 12th) seriously understates the extent of the problem Turkey faces from the Gulenist terror organisation, FETO. This has been a recurring theme in European media, which perhaps also reflects why Turkey's NATO allies were so slow to show their support for us during this year's attempted coup.

Investigators have demonstrated that FETO's political objective is to destabilise the Turkish republic and that it possesses the command structure, capacity and means to carry this out. Over the past 35 years it has established a network that has penetrated Turkish state institutions and civil society, by fair means and foul: indoctrinating recruits, stealing selection-exam papers for the civil service and armed forces, conspiring to stitch up key appointments, even framing their opponents with false evidence in court, such as in the Ergenekon and Sledgehammer cases.

The malign reach and agenda of the organisation is common knowledge in Turkey; witness the brave and decisive opposition to the coup by Turkey's citizens, by the parliament and all state institutions. Yet this is systematically overlooked by Western observers. Understanding how we feel about the Gulenist threat is vital for our future relations.

NUMAN KURTULMUS
Deputy prime minister of Turkey
Ankara

Rethinking Brexit

I welcome your general stance on the Brexit referendum, but you go too far in saying it was a clear result to leave the European Union and that MPs therefore should not vote against the government triggering Article 50 ("The way forward", November 12th). There is no established constitutional doctrine on referendums in Britain. In this case, the outcome was very close; the referendum was advisory, not mandatory; the campaign was full of misinformation and downright lies; and no indication was given (we still do not have it) of what trading and other relationships would follow with the EU and the wider world.

Although the economy has in some respects survived the referendum shock better than some had predicted, nearly all the underlying economic indicators now suggest that there is a very difficult medium and longer-term period ahead, with disposable incomes falling as inflation rises. With the added horror of Donald Trump in the White House, surely it is more important than ever that Britain should remain working closely and constructively alongside its partners within the EU.

It would be perfectly reasonable and democratic, and consistent with the practice in several other European countries, to offer the public an opportunity to think and vote again when the consequences of a Brexit become clearer. Please do not throw in the towel so easily.

BRIAN UNWIN
Former president of the European Investment Bank
Dorking, Surrey

GM crops preserve water

You say that there are many tools that farmers can use to conserve and use water efficiently ("Liquidity crisis", November 5th). However, interest groups are opposing some of those very same tools, namely genetically modified crops, which can be engineered to withstand drought conditions more effectively than their conventional peers. These modified plants are better at weathering the effects of global warming.

If the world adopted the same rates of planting GM crops as the United States, the amount of carbon released into the atmosphere would fall by 200m tons and 2m acres of cropland would return to forest and pastureland, according to a recent study from Purdue University.

In April Dannon, a French food company, announced that it is phasing out the GMO crops that feed its dairy cows. This removes one of the most effective methods for conserving water and helping Dannon reach its sustainability targets. As global warming increases, we cannot afford to let policies be built on beliefs instead of facts.

EVAN HILLAN
Ladysmith, Wisconsin

Sharing homes in London

"New York deflates Airbnb" ("October 29th) reported that not all cities see the sharing-economy accommodation model as a curse, quoting London as an example. At Westminster City Council we do not have concerns about people letting their property on a short-term basis when they are away on holiday, nor if they are letting a room within their own property.

However, commercial operators in London are letting properties on a short-term basis all year round, treating them as a business and undermining the "sharing economy" concept, as well as taking housing out of long-term use. The government has set a 90-night limit per year for lettings, but many landlords ignore this. This means that, in some cases, neighbours have to deal constantly with additional noise, scattered rubbish, loss of insurance cover and reduced security.

The future could be bright for the sharing economy, but it should not enable commercial operators to see short-term letting as a means of making profits at the expense of others wanting to live in London.

HEATHER ACTON
Westminster City councillor
London

America's record on trade

"The United States has not withdrawn from a trade agreement in 150 years", or so you claimed in "The wall that appals" (November 12th). I assume you are referring to the American abrogation in 1866 of the reciprocity agreement with the British North American colonies, which Lord Elgin had negotiated in 1854.

But although literally true, that claim ignores the Fordney-McCumber Tariff of 1922 and, more importantly, the Smoot-Hawley Act of 1930, which raised tariffs on over 20,000 items and helped bring about the Depression. America may not have been withdrawing from trade agreements, but it was passing punitive tariffs which frustrated trade agreements until the return to sanity under Franklin D. Roosevelt.

JOE MARTIN
Rotman School of Management
University of Toronto

Manufacturing-pipes dream

Your report from Sialkot, a manufacturing hub in Pakistan, brought back memories of the second world war, when good cricket bats on the subcontinent were scarce and expensive ("If you want it done right", October 29th). The talented craftsmen of Sialkot made bats from local birch. At first they were not sturdy and batsmen took unpleasant shocks to the elbow (causing one maker of bats in England to brand his as "Nonjar"), but gradually the quality improved and now cricket bats made in Sialkot are probably as good as those made elsewhere.

Sialkot also diversified into manufacturing bagpipes, and is now the biggest centre in the world outside Scotland that produces the instrument.

D.J. MADAN
Mumbai ■

Letters are welcome and should be addressed to the Editor at
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A$4.2m?
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The Price of Saving a Life ... is $3,340
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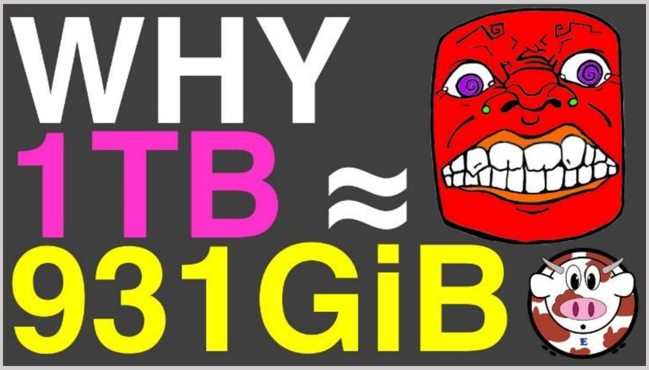
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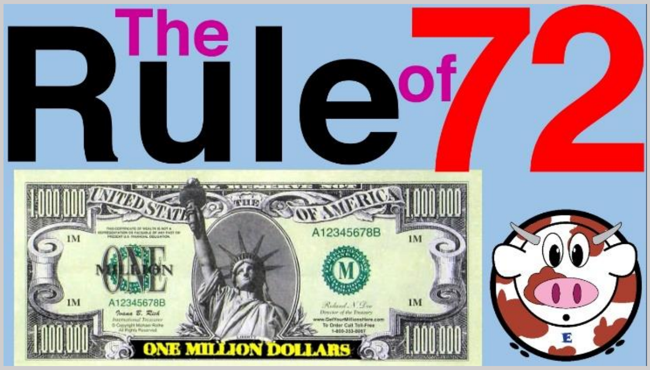
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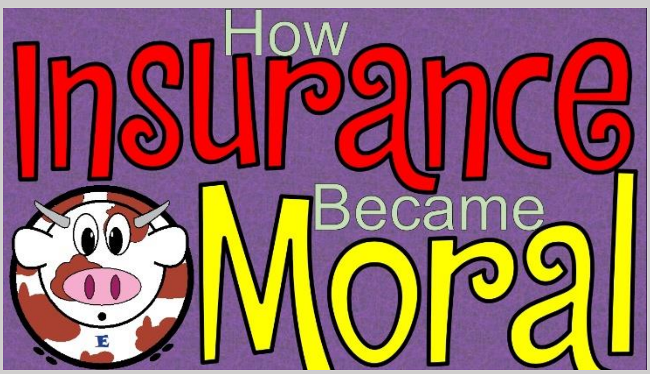
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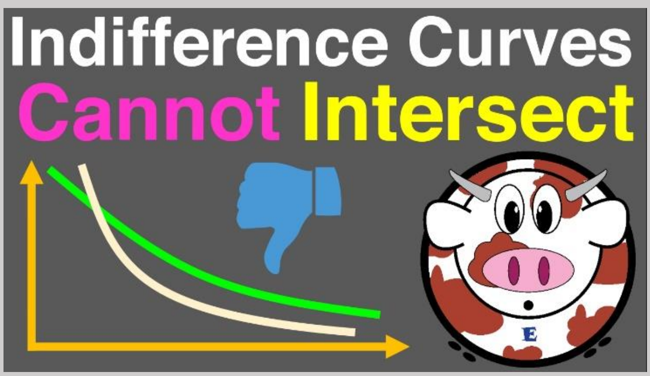
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Renzi's referendum

ROME

Italians must decide whether their prime minister's proposed constitutional overhaul will make their country more governable

ITALIAN constitutional law does not usually hold much popular appeal. And yet, even with a storm fierce enough to rattle the windows, there was scarcely a spare seat in the council chamber of Vietri sul Mare, a town clinging to the rocky Italian coast south of Naples, when Giuseppe Foscari, a professor at the University of Salerno was invited recently to set out his view. Academics such as Mr Foscari are much in demand these days to give public talks, write newspaper columns and appear on television chat shows. Abstruse constitutional questions have taken centre stage for more than a year as the country prepares to vote in a referendum on constitutional reform on December 4th.

In a country that has seen 65 governments since the end of the second world war, Matteo Renzi, the prime minister, says that changes are needed to make the country easier to govern. In his view, Italy's problems are so deeply rooted in institutional paralysis that only a government with broad powers, a stable parliamentary majority and a reasonable expectation of lasting its five-year term can defy the vested interests that hold Italy back.

Europe's fourth-largest economy is one of its most feeble, weighed down by too much regulation and woefully low productivity growth. Its economy has grown more slowly than that of most others in Europe for years (see chart 1 on next page) and GDP per head is lower now than in 1997 at constant prices. Despite a reform of labour laws under Mr Renzi, Italy's employment rate is one of the lowest in the EU.

But the danger is that the referendum will mark the next populist upheaval, after Britain voted to leave the European Union in June and America elected Donald Trump as its next president. Mr Renzi is often seen as Italy's last hope for reform, and best bulwark against the rise of anti-EU and anti-euro parties. He has staked his personal credibility on winning the referendum, saying he would resign if (as seems likely) he loses.

In a sign of investors' nervousness, yields on the debt of wobbly Italian banks and the overindebted Italian state have started to rise, reviving fears of a banking collapse and of a return of the euro-zone crisis of 2010-13. On the other hand, many Italians are reluctant to hand Mr Renzi victory because they worry about the prospect of giving much-enhanced powers to any prime minister, be it Mr Renzi or, worse, a populist leader.

Italy's constitution of 1948 was born of the desire to avoid a return to the Fascist dictatorship of Benito Mussolini. It sought to constrain governments by spreading power equally between the lower Chamber of Deputies and the Senate, the upper house. It also gave significant autonomy to four culturally distinct regions—Sicily, Sardinia, Valle d'Aosta, bordering France and the partly German-speaking region of Trentino-Alto Adige/Südtirol. Friuli-Venezia Giulia, adjoining Slovenia, was included in 1963. In 1970 more limited powers were extended to Italy's other 15 regions.

Regional government has not been a happy experiment. Adding more layers of bureaucracy to a country that already had provincial and municipal authorities has multiplied the opportunities for patronage and corruption. It has also allowed regional administrations to run up debts the authorities in Rome cannot control and has provided new ways in which the central government can be held to ransom.

Who is responsible?

Another shortcoming is the blurred lines between responsibilities. Take the management of Italy's cultural riches. The *tutela* (protection) of cultural heritage is the responsibility of the state; its *valorizzazione* (adding value to, or drawing benefit from) falls to the regions. Sandro Gozi, a junior minister for Europe, says that 70% of the decisions of Italy's Constitutional Court have been aimed at clarifying such distinctions. Yet grey areas persist. The transport minister, Graziano Delrio, notes that the Via Flaminia, a road running from Rome to Rimini, is a regional responsibility in the first region it crosses, a national one in the second and a provincial one in the third.

Mr Renzi's reform amounts to a comprehensive recentralisation of power together with a separate reworking of the ▸▸

balance of power between the two houses of parliament. The least controversial part of this is the reform of regional government. Mr Renzi's plan would not affect the five original self-governing regions, but claw back to Rome several of the most important responsibilities of the others, notably infrastructure projects and energy networks. What is more, it puts regional governments, whose responsibilities include the provision of most health services, under pressure to keep their public accounts in order.

It is the reform of the legislature, however, that is most contentious. Legislation can often be bounced back and forth between the two houses for years. Bills reported in the media as having been passed turn out never to have become law. In 1989, for example, the official gazette published a law ratifying the UN Convention against Torture. Yet the bill that makes torture an offence is still in parliament, 27 years later. It was last heard of in the Senate in July.

The prospect of legislative deadlock is enhanced by the fact that members of the two chambers are currently chosen by different sets of voters under different rules. This carries the perpetual risk of different majorities in the Chamber and Senate brought about by those rules rather than the choice of voters. Italians over the age of 18 can vote for the Chamber, but only those aged 25 or more can vote for the Senate.

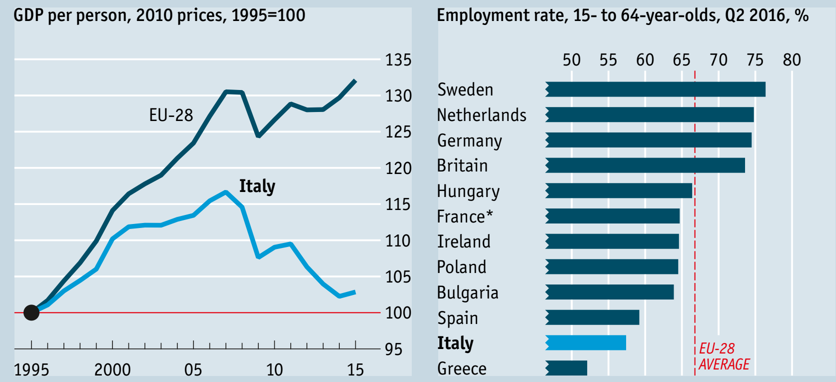
Senate, done it

Under the proposed reform, the 315-member upper house would be replaced by a smaller one, made up of five senators appointed by the president and 95 chosen from among the country's regional councillors and mayors by regional assemblies. Ex-presidents would also sit in the upper house. The remodelled chamber could suggest changes to legislation approved in the lower house, but only block a small number of mostly constitutional bills.

The impact of the referendum's reforms will be magnified by changes to electoral law. The electoral system has been altered three times since 1993. Proportional-representation, though leading to endless changes of government, produced an underlying stability during the cold war, as successive administrations led by the Christian Democrats held the line against a powerful Communist Party. After the discrediting of the established parties in the "Tangentopoli" corruption scandals of the 1990s, Italy adopted a system more akin to a British-style first-past-the-post election in the hope of holding MPs more accountable to voters and creating stable majorities.

This was changed in 2005 when Italy reverted to a system of proportional representation. The winning coalition was granted additional seats to ensure that it enjoyed a majority. The law was so flawed that its own author called it a *porcata* (rough translation: "a load of crap"), hence its nickname of the Porcellum. A new law is now in place. Mr Renzi changed it last year to one known as the Italicum, but kept many of its flaws.

The Italians flag



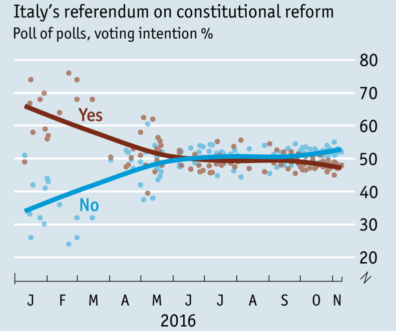
Sources: Haver Analytics; Eurostat

*Metropolitan areas only

Voters for the lower house will have to choose, as they do now, between lists drawn up by party leaders in each multi-seat constituency. Choosing a particular slate will automatically give a vote to the candidate at the top of the list but at the same time voters will be able to express up to two preferences for other candidates, rather than accepting all of a party's predetermined choices. Each party will be allocated seats according to its share of the national vote (above a 3% threshold) and these will be distributed among the constituencies, starting with the head of the list and then according to the number of preference votes for each of the others. This means that deputies will still be largely beholden to their party leaders.

Under the Italicum, as under the Porcellum, one of the lists will be guaranteed the right to govern. The Italicum engineers an assured majority by instituting a two-round ballot, in which the winner is then guaranteed 340 of the 630 seats in the lower house. And in practice, it will have more, because the share-out applies only to 617 of the deputies. Of the remainder, 12 will be chosen by Italians abroad and one by voters in the Valle d'Aosta region. It would be unusual if none went to the winning list.

No grazie



Sources: Press reports; national surveys

The Italicum does not apply to the Senate. Mr Renzi tempted providence on an epic scale, assuming that the constitutional reform would be approved and no election would be needed, as the Senate's members would either be elected indirectly or not at all.

Italy's odd arrangements have a nefarious logic. They supply what Italian politicians, and especially those in small parties, crave even more than sources of patronage: opportunities for *ricatto* (leverage or, less politely, extortion). Parties with just a tiny fraction of the national vote, or even individual lawmakers, can extract succulent favours from the government of the day. So there are plenty of politicians who regard the referendum's proposed reforms as a threat to their influence and listen with dismay to Mr Renzi's talk of making Italy a "simpler country". That senators will be mostly part-timers, drawn from corruption-prone local and regional governments (and that they will enjoy parliamentary immunity) offers little reassurance of good government.

Some opposed to Mr Renzi's scheme are alarmed about the concentration of power: the combination of a weakened Senate, a guaranteed majority and a voting system that still gives party leaders much control over deputies is seen as a recipe for authoritarian democracy. Add to that list of worries the fact that the choice of president of the republic, a key figure at times of crisis, will be more easily determined by the prime minister of the day.

The reforms might struggle for acceptance on their merits. But the vote has also become a referendum on Mr Renzi, which makes it harder for the Yes campaign to win. Ferruccio de Bortoli, a former editor of *Corriere della Sera*, was only half joking when he called the prime minister a "young *Caudillo*". He accused Mr Renzi of "contempt for the institutions and difficulty accepting criticism". Though he can be disarmingly self-deprecating, Mr Renzi is also a bruiser. He recently described himself to an interviewer as "nasty at times, arrogant and maybe impulsive", before adding with a broad smile: "Otherwise, I wouldn't have replied to you like that."

His rough-house style was at first the key to his popularity. He was the self-styled *rottamatore* ("demolition man"), who would smash Italy's complacent political establishment, take on its vested interests, stand up to the faceless Eurocrats in Brussels and set the country back on the road to economic success. As prime minister, Mr Renzi has already concentrated decision-making in his own hands to a degree unprecedented in Italy's recent history. Diplomats in Rome complain that they cannot get guidance from officials on Italian policy, even in low-priority areas, because the ruling must come from Palazzo Chigi, Mr Renzi's official residence.

Reformed, in parts

The prime minister came into office claiming he would initiate constitutional reform by the end of his first month; bring in a new employment law the next; streamline the bureaucracy in the one after that; and then overhaul taxation. Mr Renzi has fallen well short of such improbable ambitions, although he has shown greater reformist zeal than most of his predecessors. His coalition rammed through parliament a bill to give legal status to civil partnerships and tackled Italy's vulnerable co-operative banks. But his labour-market reform is not yielding the expected results: one reason Italy's employment rate is so low.

A shake-up of the public administration has only just begun. An overhaul of the judicial system is stuck in parliament. And the government's educational reform has been widely criticised. Too many of his other reforms have yet to take effect, although in some cases that is because of the inertia Mr Renzi is trying to overcome.

Mr Renzi's biggest handicap as he goes into the referendum is the lacklustre performance of the economy. Soon after he took office, he declared that, "My ambition is not to do better than Greece, but to do better than Germany." Yet since he came to office at the start of 2014 GDP has risen by less than 2%, compared with a euro-zone average of more than 4%.

Nor can Mr Renzi claim to have been hamstrung by factors beyond his control. Since early 2014, oil prices have been low, the euro-dollar exchange rate has been beneficial for exports, the European Central Bank has been pumping liquidity into the euro zone and the EU has been gradually abandoning fiscal austerity.

Would Mr Renzi have done better with greater powers? He has been able to pass the Italicum, after all. And his controversial constitutional amendment won a majority in parliament (though not the two-thirds support needed to avoid a referendum). Luigi Di Maio, a deputy speaker of the lower house and a leading member of the Five Star Movement (M5S) argues that the premise of the referendum is mistaken: Italy's legislative machinery is not blocked. "In the three-and-a-half years of this legislature, there has been a law passed every five days. If you introduce a reform, saying we must pass laws more quickly, you are just creating more bureaucracy," he notes. Important legislation does get obstructed, as Mr Di Maio concedes. "But that is because there isn't a majority in favour of that law," he insists. "It's a question of priorities, not of constitutional procedures."

The changes are opposed by all the main opposition parties, including the M5S, and by a sizeable minority in the prime minister's own Democratic Party (PD). Though the Yes campaign once had a healthy lead, the last poll to be published gives Mr Renzi little comfort. It showed 55% against the reforms and 45% for them (see chart 2 on previous page). However, 13% of those intending to vote were still undecided. In an attempt to assuage the doubters, Mr Renzi promised earlier this month to amend the Italicum after the referendum is passed. But would he do so? And if so, in what way?

If he loses, it is unlikely that the hyperactive Mr Renzi would give up politics for good. But if he resigns, or is forced out, Italian—and European—politics will enter a period of uncertainty. It would also give a short-term boost to the M5S movement led by Beppe Grillo, a former comedian, and the right-wing populists of the Northern League. But after so many changes of government Italians know how to cope with power vacuums. A caretaker government might be installed with a limited mandate to draw up a new electoral law covering both houses of parliament.

Mainstream parties may be tempted to frame one that stymied the M5S's chances of gaining office. They are talking of a highly proportional system that would prevent Mr Grillo's movement, which seems to have a ceiling at around 30% of the vote, from securing an overall majority. On the other hand, to win power for themselves, the parties of left and right would need to unite in the sort of coalition that is customarily hamstrung by policy differences.

Polls apart

The pollsters could, of course, be as wrong about the referendum as they were about the Brexit vote and America's presidential election. In those cases, voters who favoured the anti-establishment options felt embarrassed to say so. In Italy, however, the anti-establishment choice is not necessarily to vote against the government. Mr Renzi claims the real act of political demolition would be to vote Yes and alter the constitution. Back in Vietri sul Mare Mr Foscari and the local councillor who had invited him both said they suspected that it was voters in favour of the changes to the constitution who were reluctant to tip their hands. Mr Gozi said the PD's soundings gave the same indications.

A victory would bring Mr Renzi cachet for turning the anti-globalisation tide and reassure investors in Italy and beyond. But he cannot take for granted that he would be the one to profit from the additional powers that the reforms would confer.

Earlier this year local elections brought Rome and Turin to the M5S. This showed how a two-round ballot system is tailor-made for a movement that claims to be neither of the left or the right, and which can win in the closing round the votes of whichever side was eliminated. A vote in favour of Mr Renzi's reforms might increase the chances of power going to a populist movement led by a Eurosceptic former funnyman. The joke would then be on Mr Renzi—and on Italy. ■

In no mood for constitutional reform

Deforestation in Indonesia

For peat's sake

Also in this section

HENDA, BORNEO

There has been no inferno this year, but Asia's biggest tropical forests remain at risk

TEGUH, chief of the village of Henda, in the Indonesian portion of Borneo, enters his office brimming with apologies for being late. The acrid scent of smoke wafts from his clothes. He explains that he was guiding police and firefighters to a fire just outside the village. A farmer had decided to clear his land by burning it. Henda sits amid Borneo's vast peatlands; the fire had set the fertile soil smouldering for nearly 24 hours. It was a small fire, he says—perhaps a couple of hectares—but Mr Teguh still struggled to contain his exasperation, given the destruction wrought by fires set for land-clearance just a year ago.

Last year, in the autumn for the most part, at least 2.6m hectares of Indonesia's forests burned—an area the size of Sicily. The fires blanketed much of South-East Asia in a noxious haze and released a vast plume of greenhouse gases. Much of the island's interior was reduced to sickly scrub; along its roads stand skeletal trees, reproachful witnesses to the ravages they endured. Indonesia's forest fires alone emitted more greenhouse gases in just three weeks last year than Germany did over the whole year. The World Bank estimates that they cost Indonesia $16bn in losses to forestry, agriculture, tourism and other industries. The haze sickened hundreds of thousands across the region, and according to one study, hastened over 100,000 deaths.

This year, happily, has seen no repeat of last year's conflagration. Indonesia's government would say that is because it took resolute action. Having entered office seemingly indifferent to conservation, Joko Widodo, the president, universally known as Jokowi, created a government agency charged with restoring peatlands, the site of around half of last year's devastation. He issued a presidential moratorium on new palm-oil plantations and ratified the Paris agreement on climate change, committing Indonesia to cut greenhouse-gas emissions by 29% by 2030.

Downpours or directives?

But many environmentalists attribute the diminished burning this year to steady autumn rain rather than official resolve. After all, Susilo Bambang Yudhoyono, Jokowi's predecessor, also promised to halt deforestation, to little avail. He launched a showy crackdown on illegal logging when he took office in 2004. In 2009 he pledged to reduce Indonesia's greenhouse-gas emissions by 26% below the level they were then expected to reach by 2020. A year later Norway promised Indonesia $1bn if it managed to stop cutting down its forests; Mr Yudhoyono declared a two-year moratorium on forest-clearing concessions and renewed it in 2013. But by March of this year Norway had delivered just $60m of the promised billion. "We haven't seen actual progress in reducing deforestation" in Indonesia, Norway's environment minister admitted.

In recent years no country has lost forest at a faster rate than Indonesia (see chart on next page). Between 2000 and 2012 around 6m hectares of primary (meaning virgin) forest disappeared, mainly on the islands of Borneo (Kalimantan to Indonesians) and Sumatra. Roughly 40% of the deforestation took place in nominally protected areas. First come the loggers; clear-cutting and burning follow, to make way for palm-oil or timber plantations. Kalimantan's lowland forests are almost entirely gone, and as better roads make the highlands of the interior more accessible, forests there are vanishing too. Virtually all of the haze last year came from fires on those two islands.

Indonesia contains around 14.9m hectares of peatland—most of the world's tropical peat forests. Fires there are uniquely harmful, for several reasons. Peat is soggy and acidic, which prevents organic matter from decaying fully. That makes it a wonderful store of carbon—until it dries out, at which point it becomes flammable. Indonesia's peat forests were unusually vulnerable last year, due both to efforts to drain peatlands to grow crops (in their natural state they are too waterlogged for agriculture) and to drought. The haze came not just from burning tree stumps, but from the smouldering soil, too.

Peat forests can be as much as 200 times more damaging to the atmosphere when burnt than other types of vegetation, both because they store more carbon and because more of it is released as methane, an especially harmful greenhouse gas. The average incinerated hectare emits the equivalent of 55 metric tonnes of carbon. Peat forests also take far longer to regenerate than forests on mineral soils. The canals that now ribbon Kalimantan's forests remove water from peatlands, impeding restoration and leaving them more fire-prone. Between 2000 and 2010, peatland cover declined by 41% on Sumatra, 25% on Borneo and 9% on Western New Guinea.

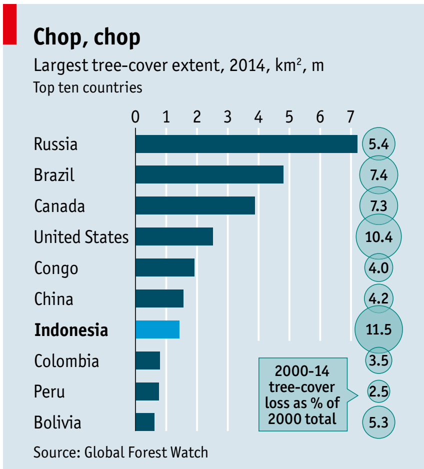
Sinan Abood, a geospatial analyst with America's Forest Service, calculates that more than one-quarter of pulpwood concessions and more than one-fifth of palm-oil concessions are located on peatland. Companies grab this land not for its productivity—mineral soil is far better suited to agriculture—but because locals own or work more productive land. Bribing an official and getting immediate access to thousands of hectares of nominally protected land is easier, quicker and cheaper than negotiating with those communities.

But Indonesian politicians friendly to big palm-oil or pulp-and-paper companies like to pretend they have community interests at heart. They fret that conservation measures would harm smallholders—individual farmers with just a few acres. Faced with evidence of illegal deforestation, politicians shrug: Indonesia is a big country, they say, and policing every two-hectare plot across 13,000 islands is impossible. In fact, a paper published in 2013 found that almost 90% of deforestation in Sumatra between 2000 and 2010 was done by big palm-oil firms. Similarly, most of the deforestation in Kalimantan results from large-scale conversion to agriculture or timber plantations.

Humala Pontas, the head of environmental rehabilitation for the provincial government of Central Kalimantan, works in the department that reviews applications for forest concessions. Almost all of them are approved. But it is nearly impossible to tell, he says, whether companies stick to the terms of their concessions. Central Kalimantan is immense, and its provincial government small and poor. "We have no monitoring system," says Mr Humala. "Last year we gave 40,000 hectares for cutting—but we have no way of knowing if they used 40,000 or 400,000."

That is a familiar story across Indonesia, where decentralisation has saddled local governments with more responsibility than they can handle. Most are simply unable to stop powerful interests bent on deforestation. Many do not want to: the financial and political benefits from allowing business to proceed as usual often exceed those from following national policy decided thousands of miles away in Jakarta. Sometimes the incentives are terrifyingly blunt: activists tell tales of attempts to enforce forestry laws being met by men with machine-guns.

Added to a lack of capacity is a woolly governmental structure that makes it difficult to know just where the buck stops, and easy for officials to pass it. WALHI, an environmental pressure group, has filed a lawsuit over deforestation in Central Kalimantan. Among the defendants are the provincial governor and parliament, as well as Jokowi and the national ministries of health, environment and agriculture—all of which have some role in forest policy. Mr Yudhoyono's moratorium came from the forestry ministry (now merged with the environment ministry), but the agriculture ministry handles licensing for palm-oil concessions. Such divisions are replicated at the local level, and the various entities rarely co-ordinate with each other.



This lack of enforcement makes it difficult for multinational firms that buy Indonesian paper and palm oil to adhere to their own policies against deforestation. A study published earlier this year by Greenpeace, another environmental pressure group, found that only one of 14 multinationals surveyed could trace its palm oil back to the plantation where it was grown. None could say with certainty that they did not use palm oil from recently deforested land; most could not say how much of their palm oil comes from suppliers that meet their standards and how much comes from third parties that do not.

This is not entirely due to sloth or negligence. Although satellites now enable real-time monitoring of Indonesian forests, overlapping land claims make it impossible to use those data to determine responsibility for deforestation, according to a recent paper by David Gaveau, a remote-sensing specialist with the Centre for International Forestry Research, which is based near Jakarta. Farmers often plant on companies' concessions, and firms often clear land outside their allocated areas. The satellites can detect forests going up in flames, but only observers on the ground can determine who set them alight.

There are a few modest reasons for hope. The bureaucracy is showing marginally more resolve: arrests for starting fires are up, and several companies have been fined or otherwise sanctioned for their role in last year's conflagration. Jokowi has continued to push Indonesia's OneMap initiative, which would gather all land-use data in one place. Nazir Foead, the head of Indonesia's new Peatland Restoration Agency, has a conservation rather than an industry background, and seems to have the president's ear. Indonesia's highest Muslim authority has issued a fatwa condemning intentional forest burning.

Individual Indonesians are doing their part, too. In a churchyard near Henda, Mr Teguh pushes aside some plastic sheeting on a crude bamboo greenhouse, and proudly displays rows of native hardwood saplings. He grows hundreds of thousands each year to help reforest peatlands in Kalimantan and Sumatra. He plucks a wrapped sapling, twig-thin but crowned with a spray of healthy, spiky leaves. "This is the best we can do to help God," he says. It will take far more than that, alas, to return Indonesia's forests to health. ■

More haze, less speed

Women and work in Japan

More glaring than shining

TOKYO

The government's efforts to raise women's status in the workplace are faltering

SHINZO ABE, Japan's prime minister, is an unlikely champion of women's empowerment. A lifelong conservative and the leader of a party that for decades battled feminism, Mr Abe has undergone a conversion, prompted by Japan's alarming demography: the workforce is projected to shrink by about 25m people—well over a third—by 2060. Meanwhile, millions of university-educated women sit at home, their talents squandered, says Kathy Matsui of Goldman Sachs. "Japan has more to gain than most countries from raising female labour participation."

Yet, four years into Mr Abe's stint in office, and 17 years since Ms Matsui coined the term "womenomics", the government is still struggling to make Japanese women "shine", its clumsy rhetorical catchphrase for raising the standing of women at work. The latest gender-gap index published by the World Economic Forum (WEF) ranks Japan 111th out of 144 countries, a fall of ten places since 2015. Just 9.5% of the members of Japan's lower house are women, putting the country 155th in the world by that measure. Under Mr Abe, the number of female directors at Japanese firms has inched up—to a paltry 2.7%.

The government takes credit for adding about 1m women to the workforce since 2012. At 66%, the female participation rate is now among the highest in the world, says Masako Mori, a former minister of state for gender equality. That is largely the result, say critics, of Japan's drum-tight labour market rather than of innovative policies. Mindful that most of these jobs are far down the corporate totem pole, the government has also revived a decade-old target of having women occupy 30% of "leadership positions" by 2020. But it admits that this goal is nowhere near being met.

The government has done more to improve women's lot than these statistics suggest, insists Haruko Arimura, a former minister in charge of women's empowerment: "For the first time ever we are talking not about if women should be in charge, but how." Ms Arimura helped pass a landmark law last year aimed at ending corporate sexism. Companies and bureaucracies with 300 or more employees must reveal how many female workers and managers they employ, and set targets for promoting them. The aim, she says, is to shame male bosses into doing better.

Public opinion is clearly shifting. For the first time most Japanese people agree that mothers should be allowed to continue their careers, according to a new survey by the Cabinet Office. A string of stories has appeared in the media on the once-overlooked problem of *matahara* (a portmanteau of "maternity" and "harassment"). The fact that roughly 47% of women leave work after having children has occasioned much hand-wringing, too. It is especially unfortunate, the WEF notes, since Japanese women are healthier, better-educated and longer-lived than their peers almost anywhere else in the world.

Ms Arimura, a mother of two, recalls the petty harassment she suffered when she opted for a political career: "People said they felt sorry for my children and husband." She believes such attitudes can be fought with public leadership and greater state support. The government has promised to end a chronic shortage of child care by the end of next year. A trickier problem, she acknowledges, may be calcified working practices.

Male workers still dominate the most important, full-time positions at Japanese companies. For most of them, long working hours make doing their share of child-rearing impossible. Labour reforms introduced a decade ago, meanwhile, have accelerated the growth in the number of temporary workers, of whom an outsize share are female. The trend towards a bifurcated workforce, largely divided by gender, continues under Mr Abe, says Ayaka Shiomura, a member of Tokyo's metropolitan assembly.

Companies and unions are loth to dismantle Japan's employment system, but without more flexible labour practices, womenomics will fail, warns Nicholas Benes, the head of the Board Director Training Institute of Japan. He wants to see a new type of hybrid contract, with sabbaticals and alternative career paths for mothers, alongside the standard path for other employees. Parliamentary discussions on workplace reforms are under way, but the outcome remains uncertain. Some companies, desperate to keep workers, are already converting irregular positions to full-time ones, says Ms Matsui. Whatever happens, Mr Abe's achievement, she says, has been to change female empowerment from a human-rights issue to an economic imperative. "That's a big shift." ■

Civil society in Vietnam

Ambiguity of assembly

HO CHI MINH CITY

A long-mooted law on associations gets shelved yet again

EVERY Sunday deaf children meet to learn sign language in a borrowed classroom in Ho Chi Minh city, Vietnam's southern metropolis. Pham Cao Phuong Thao began organising the lessons after her own son was born with hearing difficulties; her students include street children whom disability has made hungry. But after years of effort Ms Thao has still not obtained the permits that would make her charity legal. She says the paperwork produced to support her applications forms a stack a metre high.

Ms Thao's small organisation is among more than 300,000 charities, clubs and associations operating in Vietnam, a single-party state with an increasingly vibrant civic life. Yet the country's Byzantine bureaucracy—and the ruling Communist Party's paranoia—leaves these outfits in a ▶▶

bind. For years campaigners had dared to hope that a proposed law, which was supposed to pass on November 18th, would help cement citizens' right to associate. Instead lawmakers talked of tightening restrictions on civil society before shelving the bill altogether.

In theory the needs of Vietnamese are met by a suite of state-approved professional clubs and community groups, which are sponsored and closely supervised by government agencies or by wings of the Communist Party. In practice many associations muddle along outside this structure. Groups promoting civil liberties, labour rights and other dangerous topics are resigned to operating informally. But some others—working in areas such as environmentalism, or in aiding the aged, addicted or orphaned—are locked out of the system by overcautious government gatekeepers who fear they might accidentally endorse troublemakers of some kind. Without proper paperwork, such groups battle to open bank accounts, hold events, rent venues or raise cash. The problem is particularly acute in the south, which the party still views as less ideologically sound—a legacy of the Vietnam war.

No one expected the draft law on associations, which was dusted off in 2015 after several years in storage, to bring dramatic change. The hope was that it would clarify rights that currently exist in a patchwork of decrees—and are often disregarded by local bureaucrats—creating a firm legal footing from which to advance. But during revisions legislators peppered the text with new prohibitions, including a clause which would have banned even duly registered foundations from receiving money from abroad. Campaigners and foreign donors who had cautiously welcomed the draft law were relieved when the national assembly put it back on ice.

Vietnam has good reason to ease up on civic-minded citizens. Government debt is reaching its legal limit of 65% of GDP—a reminder of the limits of what the state can afford. There is also a growing move to streamline government. The authorities are pressing ahead with the privatisation of bloated state-owned enterprises; by the same token, party bigwigs must surely question the utility of the big subsidies they pump into often sluggish state-sanctioned clubs and associations. Some cadres probably calculate that it would be easier to spot agitators if more groups were encouraged to operate openly rather than to organise clandestinely online.

But these considerations do not yet outweigh the fear of acting as a midwife to movements that might threaten its control. It probably did not help that the debate on the law coincided with broad outrage over mass fish deaths caused by a polluting steel mill which, among other impacts, has pushed environmentalists higher up the government's watch-lists. The death of the Trans-Pacific Partnership (TPP), a planned American-led trade deal, has also dampened Vietnam's appetite for reform. Delay in passing a law on associations makes it less likely that Vietnam will fulfil a bold promise to begin tolerating independent trade unions, which it made during negotiations for TPP and towards which the legislation was supposed to be a small step.

As for Ms Thao, she intends to keep badgering authorities to register her group. She wants to help create a dictionary of Vietnamese sign language, needed to unify divergent regional practices. That would be easier if she had the papers required to pester foreigners for donations. But they are still on hold—like the law. ■

Fans, but no papers

Australia's natural gas

Poor credit

The government is charging energy firms relatively little to extract natural gas

IN GREEK mythology, a gorgon was a creature so hideous that anyone who looked at one turned to stone. In contemporary Australia, Gorgon is an enormous liquefied natural gas (LNG) project which was supposed to pay huge economic dividends. It is the centrepiece of a decade-long, A$200bn ($148bn) construction boom in gas-export facilities. In 2019 Australia is likely to surpass Qatar to become the world's biggest exporter of LNG. The benefits to the government, however, have not been as quite as entrancing as expected.

At one point Chevron, the company running Gorgon, promised the government so much revenue that it would be able to lower personal income taxes. As recently as March the energy minister, Josh Frydenberg, hailed "the golden age of gas" and forecast that Gorgon alone would add a total of A$440bn to the economy. Yet the Treasury says that revenue from the petroleum resources rent tax (PRRT), through which energy firms pay the federal government for the right to extract oil and gas, is forecast to fall from A$1.2bn in the fiscal year that ended in mid-2015 to A$800m in 2020—even as the volume of exports soars.

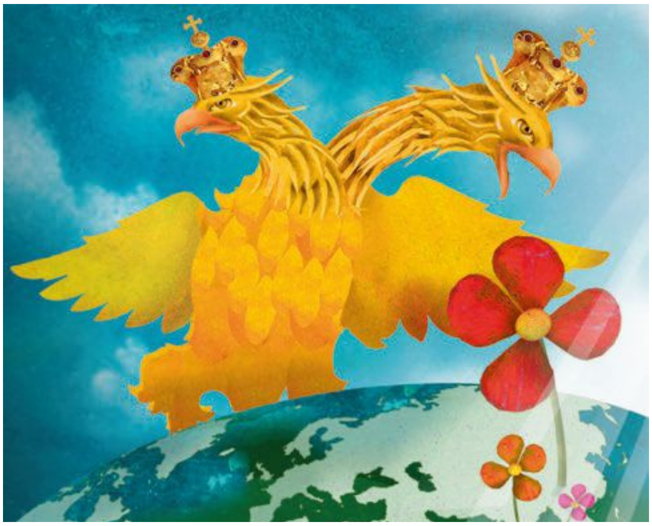
That is down to the remarkably generous design of the tax. Unlike most royalty regimes, it is not levied at a flat rate on the volume of gas extracted. Instead, it is linked to the project's profits. Companies are allowed to recoup their exploration and construction costs, which tend to be huge for LNG projects, before any tax is payable. These deductions can be carried forward indefinitely, potentially delaying the Treasury's payday for decades. According to the Australian Tax Office, the value of unused deductions rose from A$1.7bn in 2004-05 fiscal year to A$188bn in 2014-15—meaning that firms can rake in a further A$187bn before paying any tax.

The generosity was at least partly deliberate, in order to stimulate economically beneficial investment. But a study by the International Transport Workers' Federation suggests the PRRT may have gone too far. Governments of rival exporters, such as Qatar, Malaysia and Nigeria, received two or three times as much revenue as Australia's in 2014 as a proportion of the value of the gas produced. A senator from the Australian Greens, Larissa Waters, has called for a parliamentary inquiry into the tax, describing it as a "rort" (Australian slang for scam). One of the original architects of the PRRT, a former trade minister, Craig Emerson, wants an investigation into subsequent government tax breaks that may have further reduced its take.

There is also dismay at state level. The Liberal government in resource-rich Western Australia, which is behind in the polls for an election in March, has called for a review of government spending in support of LNG projects. But there is little chance of the federal government souring on the gas industry. The environment minister who gave Gorgon the green light in 2007 was none other than Malcolm Turnbull, now the prime minister.

Banyan | The other pivot

Russia is leaning east, but its engagement with Asia is superficial



RUSSIA'S twin-headed eagle faces east towards Asia as well as west towards Europe. This far-sighted beast is near-as-dammit the heraldic coat-of-arms of Vladimir Putin, who revived the old imperial symbol. So why does the president of a country with half its vast lands lying east of Singapore need to make so much of his "pivot to Asia", declared two years ago? That many readers familiar with the much-maligned Asia pivot of Barack Obama will not have heard of Mr Putin's hints at a gap between rhetoric and substance. And yet the prevailing view among pundits is that Russia is indeed back in Asia.

Once the Soviet Union and China were a hair-trigger away from war along their long border. Today many see a new strategic convergence or even an alliance in the making between Russia and China, the world's second- and third-biggest military powers. The two states' media paint Mr Putin and Xi Jinping, China's president, as strongmen buddies. In 2014 they signed a huge deal to bring Russian gas to China. Recently, Russian sales to China of advanced weapons resumed after being halted a decade ago because of technology cloning.

In September, China and Russia conducted joint naval exercises in the South China Sea, where China has grandiose territorial claims. Russia is officially agnostic about those, but the exercises gave support to China's position. In short, the pair's "strategic partnership" is receiving regular upgrades. This year Mr Putin described the love-in as "all-embracing".

Belatedly, Russia has realised that there is more to Asia policy than China. It wants influence elsewhere in the Indo-Pacific region. Ties with India have strengthened through civilian nuclear co-operation and weapons sales. Russian ships have returned to Cam Ranh Bay, a port in Vietnam once used by the Soviets.

A first for Russia, Mr Putin hosted a lavish summit of the Asia-Pacific Economic Co-operation (APEC), a regional talkfest, in Vladivostok in 2012. Last year Russia launched its own annual powwow in the same Pacific port, the Eastern Economic Forum. In December comes a striking diplomatic gambit—a visit to Japan at the invitation of the prime minister, Shinzo Abe, to discuss not just economic co-operation but also a resolution to a territorial impasse over the four southernmost Kurile islands, which Japan calls its Northern Territories. Stalin grabbed the islands in the closing days of the second world war; seven decades on, the impasse precludes the signing of a peace treaty and has impeded the flow of Japanese money and expertise to the neglected Russian Far East. Mr Abe, though a nationalist, is not in the macho mould of the often bare-torsoed Mr Putin. Nevertheless, he hopes to get the islands back in a naked man-to-man session with the Russian president in a hot spring in his home prefecture.

Mr Putin may relish the experience. He knows that Japan wants to pull Russia away from China, which Japan views as a grave threat. And Mr Abe has personal reasons to secure a coup over the Northern Territories: foreign policy is an inherited duty among Japan's hereditary politicians, and the signing of a peace treaty was the fond wish of his late father, Shintaro Abe, a long-serving foreign minister. So Mr Putin will pocket Mr Abe's financial inducements but make a derisory offer over the islands—perhaps the return of the two smallest, barely inhabited ones.

Most of all, Mr Putin will chuckle at appearing to peel away America's chief Asian ally from the united front of displeasure that Mr Obama assembled after Mr Putin's annexation of Crimea and his invasion of eastern Ukraine. Indeed, look closely at the Russian pivot, and it has little to do with engagement in Asia for its own ends. Russia's trade policy in the region boils down to selling weapons to anyone who will buy them (including most of the claimants in the South China Sea dispute, thereby fuelling an arms race). Russia's trade with Asia accounts for a piddling 1% of the region's total, and Asia's economic miracle has scarcely touched the 6.4m Russians in the dilapidated cities of Russia's Far East. Many seethe that sprucing up Vladivostok for the APEC summit cost $20bn, more than the London Olympics and more than Russia will spend developing the region in the years to 2025.

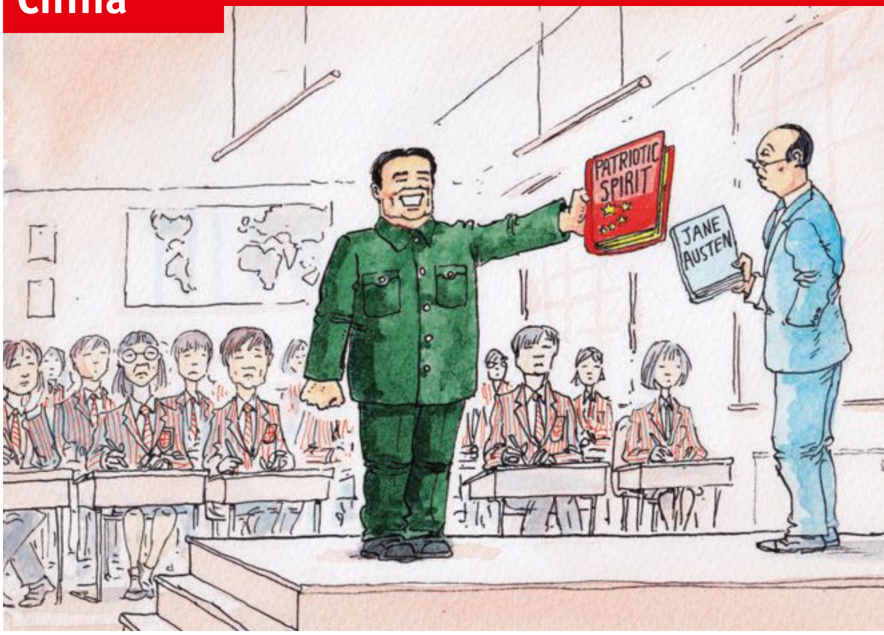
Asia is almost incidental to the strategic imperative of the pivot, which is to bolster Russia's standing in its all-consuming confrontation with America and the West. The gas deal with China occurred only after Western sanctions limited Russian options in Europe. Russia resents the terms on which it was struck, and suspects that China will seek to renegotiate if gas prices stay low.

Bobo Lo, a Russia specialist, describes a "virtual reality" of propaganda which insists that Russia and China, both state-directed economies with concerns about American power, look at the world identically. But mutual distrust runs deep. Russia has been conditioned by its history of expansion into Asia to look down on China as the lesser power, so its current status as a source of commodities for China feels humiliating. Elsewhere, Russia wants to undermine the American-led world order of which it has been the biggest loser. By contrast, says Mr Lo, China has been the chief beneficiary of that order, having adopted wrenching economic reforms to capitalise on it. It knows that its most critical relationship is not with Russia but with America.

Enraptored

What, then, if Russia's relations with America were to change? They have certainly been strained, over Crimea, Ukraine and Mr Putin's part in the destruction of Syria. But just suppose that Mr Putin and Donald Trump, America's president-elect, pursue the rapprochement that both men say they want. Suppose America cuts Mr Putin slack in Europe, the region of his real aspirations, and even the Middle East. What would happen to his Asian pivot? Pacific Russians have a sardonic take on Moscow's imperial eagle. Its vision may take in both West and East, but "*Stoit zadom k Azii*"—it stands with its back to Asia. ■

Also in this section



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Education

Patriotic energy v West-worshipping

BEIJING

International schools are the next front in the Communist Party's battle against foreign influence

CHINA has long oscillated between the urge to equip its elite with foreign knowledge and skills, and an opposing instinct to turn inward and rebuff such influences. In the 1870s the Qing imperial court ended centuries of educational isolation by sending young men to America, only for the Communist regime to shut out the world again a few decades later. Today record numbers of Chinese study abroad: over half a million people left in 2015 alone, many for America (see chart). The Communist Party officially endorses international exchanges in education while at the same time preaching the dangers of Western ideas on Chinese campuses. A new front in this battlefield is emerging, as the government cracks down on international schools catering to Chinese citizens.

Only holders of foreign passports used to be allowed to go to international schools in China: children of expat workers or the foreign-born offspring of Chinese returnees. Chinese citizens are still forbidden from attending such outfits, but more recently a new type of school has proliferated on the mainland, offering an international curriculum to Chinese nationals planning to study at foreign universities. Their number has more than doubled since 2011, to over 500. Many are clustered on the wealthy eastern seaboard, but even poor interior provinces such as Gansu, Guizhou and Yunnan have them.

Some international schools are privately run, including offshoots of famous foreign institutions such as Dulwich College in Britain or Haileybury in Australia. Even wholly Chinese ventures often adopt foreign-sounding names to increase their appeal: witness "Etonkids", a Beijing-based chain which has no link with the illustrious British boarding school. Since 2003 some 90 state schools have opened international programmes too, many of them at the top high schools in China, including those affiliated with Peking University and Renmin University in Beijing.

New laws are making it harder for such schools to operate. In 2014 Beijing's education authorities stopped approving new international programmes at public high schools. Several other cities, including Guangzhou, Shanghai, Shenzhen and Wuhan, have also tightened their policies on such institutions. Some have capped fees for international programmes. The Ministry of Education says it is pondering a law that would require public high schools to run their international programmes as private entities (fearing this event, a few schools have already begun doing so).

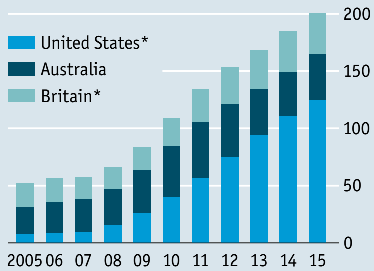
Earlier this month a new law banned for-profit private schools from teaching the first nine years of compulsory education. That came only days after Shanghai started to enforce an existing ban on international schools using "foreign curriculums". Some such institutions already offer a mixture: Wycombe Abbey International, which is based in Changzhou in eastern China and affiliated to a British girls' boarding school, teaches "political education", a form of government propaganda, and follows a Chinese curriculum for maths. But the new regulations threaten to nullify the very point of such institutions for most parents, which is to offer an alternative to the mainstream Chinese system, in which students spend years cramming for extremely competitive university-entrance exams that prize rote learning over critical or lateral thinking.

Lawmakers say the rules are prompted by concerns about the quality of international schools. The expansion of international programmes within regular Chinese schools also spurred a popular backlash against the use of public facilities and funds to teach pupils who plan to leave China. Since the number of people attending public schools is fixed, the elite high schools are accused of squeezing out regular students to feed their lucrative international stream. Local governments often provide capital for private schools, too.

The move to control international schools is "the next logical iteration" of a

On an enroll

Chinese undergraduate students, '000



Sources: IIE; HESA; Australian Department of Education and Training *Academic years wider campaign against Western influences, reckons Carl Minzner of Fordham University in America. In 2015 China's education minister called for a ban on "textbooks promoting Western values" in higher education.

This mission extends far beyond the educational realm: the government has called for artists and architects to serve socialism, clamped down on video-streaming sites that carry lots of foreign content and even proposed renaming housing developments that carry "over-the-top, West-worshipping" names. Chinese organisations that receive foreign funding, particularly non-governmental ones, face increasing scrutiny.

The Communist Party is instead seeking to inculcate young Chinese with its own ideological values: the new directive on for-profit schools calls on them to "strengthen Party-building". After pro-democracy protests in Tiananmen Square in 1989, nationalistic "patriotic education" classes were stepped up in schools, a move that Xi Jinping, the president, has taken to new levels since 2012, seeking to infuse every possible field with "patriotic spirit". "Morals, language, history, geography, sport and arts" are all part of the campaign now. Unusually, he also seeks to include students abroad in this "patriotic energy".

But lashing out against international schools could prove risky. Any attack aimed at them essentially targets China's growing middle class, a group that the ruling Communist Party is keen to keep onside. Chinese have long seen education as a passport to success, and it is not just the super-rich who have the aspiration or means to send their offspring abroad to attend university. Some 57% of Chinese parents would like to do so if they could afford it, according to the Shanghai Academy of Social Sciences. Even Mr Xi sent his daughter to Harvard, where she studied under a pseudonym.

Since school is optional after 15, and parents must pay for it, even at public institutions, the state will find it tricky to prevent high schools from teaching what they want. Moreover, constraints on international schooling in China are likely to swell the growing flow of Chinese students leaving to study abroad at ever younger ages. This trend is the theme of a 30-episode television series, "A love for separation", about three families who send their children to private school in America.

Restricting for-profit schooling also risks hitting another growing educational market: urban private schools that cater to migrant children who cannot get places in regular state schools because they do not have the required residence permits. A law that undermines educational opportunities for the privileged and the underprivileged at once could prove far more incendiary than a little foreign influence. ■

China's national parks

A farewell to loudspeakers

NANJING

The government tries to bring order to a chaotic jumble of protected spaces

ONE need only drive 30km west from the bustling heart of downtown Nanjing—population about 7m—to reach the shady sanctuary of the Laoshan National Forest Park (pictured). But on a recent sparkling autumn afternoon only a trickle of visitors had come to enjoy the abundant birdsong, the scent of pines and the rustle of falling ginkgo leaves. Unlike many of China's wilderness attractions, Laoshan has eschewed the hurly-burly of market stalls and other facilities intended to cater to a crush of tourists. There are simple wooden steps installed here and there, but no concrete staircases, iron railings or trails festooned with coloured pennants and loudspeakers playing soppy music.

Roughly 18% of China is given over to national parks or protected areas of some sort. But there is no overarching system for managing or even designating such places; instead, they are subject to a complicated, overlapping and haphazard mix of local, provincial and national administration. Laoshan is a case in point. Since its establishment in 1991, its official status has changed multiple times, from a provincial scientific reserve to an environmental one to an "AAA-level touristic scenic spot". Its current "national park" designation only appears on some signs.

Happily, through all these incarnations, Laoshan has escaped the urge of many bureaucrats to manage scenic spots more for profit than for conservation. Provincial authorities often take it upon themselves to name places as national parks, with a view to selling overpriced tickets or fostering pell-mell development. Environmental protection, if considered at all, is typically an afterthought. Partly because of this uneven quality, a handful of sites attract the lion's share of visitors.

An AAA-level touristic snap

China's increasingly urbanised and urbane population has a growing appreciation of the great outdoors. Nature-lovers are choosing to stop and smell the roses at national parks, rather than simply snapping a few photos. That means more overnight camping and hiking, rather than a brief shuffle past on a half-day bus tour.

Yet there is no logic or consistency to the facilities on offer, the fees charged, the development permitted or the conservation work undertaken at China's 8,000-odd parks, reserves and protected areas. They are run not just by different levels of government, but by different agencies at each level: some fall under the forestry administration, some under the ministry of environmental protection and others under the tourism-promotion agency. The authorities are trying to instil some order to this jumble—and in the process taking advice from an unlikely source: America's National Park Service (NPS).

For many Chinese visitors to America, the tourist itinerary has recently begun to include not only Disney World, Las Vegas and New York, but also national parks such as Yellowstone. In 2015 1.1m Chinese visited national parks and monuments in America, more than twice as many as three years earlier. Last year the national government began consulting the NPS and several NGOs with a view to creating a park system similar to America's.

Bureaucratic turf wars are the biggest obstacle to reform. In some cases, one agency is responsible for the trees, another for the rivers and lakes, a third for the wildlife and a fourth for the roads leading to it all. The natural bureaucratic reluctance to cede power is all the greater where profits from tourism fees or concessions are at stake. A provincial forestry official in south-western Yunnan province—the site of many protected areas—privately predicts that infighting will persist and that progress towards a more orderly system will be slow.

Yet the rewards could be great. A more coherent system could not only improve conservation, but also raise revenue, by helping to promote less-visited sites. America's national parks received some 307m visits last year; tourists spent almost $17bn in their vicinity. Rudy D'Alessandro of the NPS says Chinese officials have told him: "We don't want you giving us your culture because we don't always like your culture. But we admire your national parks and want to learn more about them." ■

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Reflating the economy

King of debt

WASHINGTON, DC

To create a boom, Donald Trump may have to disappoint his blue-collar supporters

SINCE the financial crisis, many left-leaning American commentators have yearned for more deficit spending to reflate the economy. Few would have predicted that a Republican administration would be the one to heed their calls. Yet financial markets seem to be betting that President-elect Donald Trump, backed by Republican majorities in the House and Senate, will go on a budgetary binge that ignites economic growth. Since the election the S&P 500 index of shares has jumped 3%, led by stocks like banks and retailers that soar and sink with the economic cycle.

Such expectations are not baseless. During the campaign Mr Trump called for tax cuts which, according to the Tax Policy Centre, a think-tank, would cost an eye-watering $7trn over a decade, raising the debt-to-GDP ratio by 26 percentage points (or, based on current projections, to 111% of GDP) by 2026. He promised new infrastructure spending worth $1trn, more money for defence and no cuts in spending on pensions and health care for the elderly (which is forecast to soar over the next decade). All else equal, such largesse should indeed give the economy some temporary vim. But there are three main reasons to doubt that a big boom will materialise.

The first is that Republicans in Congress are much less keen on loosening the purse-strings. Paul Ryan, Speaker of the House, has proposed tax cuts only half as big as Mr Trump's. Kevin Brady, chairman of the House Ways and Means Committee, said on November 16th that he expected any tax reform to pay for itself (even if that is partly by boosting growth). True, Mr Trump is likely to court Democratic votes for infrastructure spending. Still, market expectations "may be running ahead of political and legislative realities", says Alec Phillips of Goldman Sachs, a bank forecasting that Mr Trump will wind up with enough new spending to boost growth by a modest 0.3 percentage points for two years.

The second reason to be sceptical of a Trump boom is that a massive fiscal stimulus would be poorly timed. The chief argument for bigger deficits after the crisis was that unemployment was too high, and, with interest rates stuck near zero, there was little the Federal Reserve could do about it. But today, with unemployment below 5% and wage growth picking up, there is much less slack in the economy. And the Fed, which is worried about inflation round the corner, is expected to raise rates in December.

A soaring deficit could make the central bank more hawkish. Quizzed about stimulus before a congressional committee on November 17th, Janet Yellen, the Fed's chairman, questioned whether the economy needed much more spending. It is within the power of Ms Yellen and her colleagues to flatten Mr Trump's stimulus by tightening monetary policy faster.

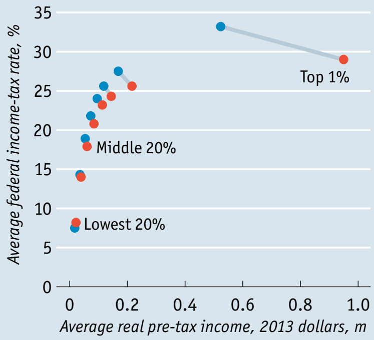
Markets seem to be expecting higher interest rates, rather than an inflationary boom. The yield on ten-year government debt now hovers around 2.4%, up almost 0.5 percentage points from election day. But inflation expectations, measured as the gap between yields on inflation-indexed bonds and the normal sort, are up only half as much. That suggests an expectation of higher rates, as well as higher prices, is pushing yields up. In the week to November 16th the dollar, which tends to rise with interest rates, rose 2.3% in trade-weighted terms—its biggest weekly gain since October 2008. Compared with this, the rise in the stockmarket since the election has been unexceptional: on five other occasions during 2016 the S&P 500 has recorded a larger gain over two weeks. Stocks that do poorly when interest rates rise, such as utilities, have suffered since the election.

The third reason for circumspection is uncertainty over the details of Mr Trump's infrastructure spending. "With negative interest rates throughout the world, it's the greatest opportunity to rebuild everything…we're just going to throw it up against the wall and see if it sticks," said Steve Bannon, Mr Trump's incoming senior adviser, to the *Hollywood Reporter* on November 18th. But this carefree, spendthrift attitude does not chime with Mr Trump's plan, which was penned by Wilbur Ross and Peter Navarro, two of his economic advisers, and released shortly before the election.

Based on that document, of the $1trn in planned spending, perhaps $140bn comes from the government (which, despite Mr Trump's bluster, is less than the combined $500bn Hillary Clinton wanted Congress to spend or lend to developers). The administration would not direct that money itself. Instead, the government would give firms who invest in private infrastructure projects a tax break worth 82 cents for ev- ▸▸

Trickle up

United States, average income and tax rate
By income group ● 1980 ● 1988



Source: Congressional Budget Office

ery dollar of equity they stump up.

It is not clear how much juice this private-sector money would add to the economy. Critics say that investors might just shift money towards subsidised projects, rather than spend afresh. Problematically, the plan could only fund profitmaking infrastructure projects, like toll bridges. Laws banning the government from retrospectively adding tolls to existing roads—which would be very unpopular even it were always legal—mean such a set up would not help much with the country's backlog of maintenance. The scheme is more likely to subsidise "pointless" new projects, according to Randal O'Toole of the Cato Institute, a libertarian think-tank.

Return of the supply-siders

Boosting spending is not the only route to growth. Republicans have often called for tax cuts not as a fiscal stimulus, but as a way to encourage work and investment in the long run. Might Mr Trump's boom come from greasing the wheels of the economy, rather than juicing its engine?

There is certainly room for some gains on this front. Mr Trump wants to slash the corporation tax rate from 35%, the highest rate in the OECD, a club of mostly-rich countries, to 15% (Mr Ryan has proposed a rate of 20%). That should encourage investment. Mr Trump's deregulatory agenda—he promised on November 21st that for every new regulation written, he would roll back two—should do the same, whatever its other costs.

The problem is that two key planks of Mr Trump's campaign, protectionism and an immigration crackdown, would pull in the other direction. Dan DiMicco, Mr Trump's trade adviser who now leads the transition team for the Office of the United States Trade Representative, told *The Economist* before the election that "the era of trade deficits is over". But funding bigger government deficits will require inflows of capital from abroad, the flipside of which is larger, not smaller, trade deficits. If protectionism stops foreigners stumping up the cash for Mr Trump's spending binge, American savers will have to. That will reduce the funds available for private-sector investment, hampering growth.

Cutting taxes might create enough growth to allow Mr Trump to quietly moderate his protectionism, or at least to offset it. In the 1980s Ronald Reagan sent deficits ballooning by cutting taxes for the rich, and oversaw fast growth in spite of modest protectionism. A second "Reagan revolution" would certainly please many Republicans. But the top rate of federal income tax today is 39.6%, compared with 70% in 1980. History also suggests this recipe would do little for the fortunes of those blue-collar workers whom Mr Trump pledged to shield from foreign competition. Gains in real income between 1980 and 1988 were heavily skewed towards the richest (see chart). Middle-earners, whose average tax rate fell by a percentage point, saw real pre-tax income gains of just 0.6% a year. By contrast, the top 1% of earners saw their average tax rate fall by four percentage points while their pre-tax real incomes surged by 7.7% a year.

In short, Congress and the Fed are immediate obstacles to a debt-fuelled economic boom. Over a longer period, Mr Trump could be his own worst enemy. Markets are betting that he will abandon the issues that defined his candidacy and disappoint the voters who won him the election. They may turn out to be right. But if they are not then, like Clinton supporters, they are in for a painful realisation. ■

The big gaggle

Fifth Avenue frenzy

NEW YORK

The president-elect has shut down midtown Manhattan

CONCRETE barriers have been installed along the streets surrounding Trump Tower. Police have blanketed the area, setting up security checkpoints. Metal barricades corral pedestrians. The media are penned across the road from the tower, while their satellite trucks are parked round the corner on busy 57th Street. Two of Fifth Avenue's five traffic lanes are closed. Part of East 56th Street (the main entrance to Mr Trump's penthouse) is closed indefinitely to both vehicles and pedestrians.

Traffic is nothing new to New Yorkers. Sam Schwartz, a transport engineer, likes to joke about the two New Yorkers who asked each other, "Should we walk or do we have time to take a cab?" He thinks the mess could hasten the introduction of congestion pricing. New Yorkers are also accustomed to high-profile visitors, like President Barack Obama, causing temporary chaos. The new gridlock may last much longer. Mr Trump's wife and youngest son, who is still at primary school, may continue to live in their Trump Tower penthouse. Mr Trump likes to sleep in his own bed, which suggests he will often come back from Washington. The added security comes at a cost. CNN reports that New York city spends $1m a day to protect the Trumps. Bill de Blasio, the mayor, refused to confirm this figure, but has said that the city deserves "a substantial amount of reimbursement" from the federal government.

Since the election, protesters, the press and gawkers flocking to the tower have made it difficult for local businesses to operate. Already crowded pavements are becoming clogged with selfie-takers.

Welcome home

None of the high-end retailers along the avenue would comment on whether they are feeling a pinch, but they must be.

People living and working in Trump Tower and the surrounding streets have to navigate checkpoints to get to work or home again. The tower's atrium is still open to members of the public prepared to endure airport-style security. "In the long term, having Trump on Fifth Avenue will help retailers," says Michael Shvo, owner of the Crown Building which sits across the street from the tower. He reasons that tourists will still flock there, wallets open, after the chief occupant leaves for the White House. Fifth Avenue is still open for business. But as Yogi Berra once said, "Nobody goes there any more. It's too crowded."

North Carolina

Not going quietly

RALEIGH

A rare Democratic victory—and a sore Republican loser

RUTHLESS politicians often try to pin their own vices on their critics: anti-corruption campaigners, for example, frequently find themselves accused of graft. So it has proved with North Carolina's Republicans. A federal court recently found that voting restrictions they passed in the state legislature targeted African-Americans with "almost surgical precision". Now, having botched the race for governor, some are baselessly alleging voter fraud among their opponent's supporters.

Before the election, several opinion polls in North Carolina suggested that both Hillary Clinton and Deborah Ross, the Democratic candidate for the Senate, would win. In the event, both lost soundly. But Roy Cooper, the Democratic contender for governor, narrowly held on to his lead over Pat McCrory, the incumbent. At the last official count, Mr Cooper was ahead by over 7,000 votes, though his team thinks the real figure is higher. He has duly declared himself the victor. But, facing the prospect of becoming the first governor of North Carolina to fail in a re-election bid, Mr McCrory has refused to accept defeat.

His allies have launched protests in dozens of counties, complaining of illegal voting by felons or the dead. Many such appeals are frivolous: Democracy North Carolina, a watchdog, found that, among the tiny number of supposed felons, almost half were not felons at all. Even after the court squashed the most egregious restrictions imposed by the legislature, voting-rights activists had graver concerns: over the purging of rolls and limited opportunities for early voting, including in areas hit by flooding. (The state Republican Party unwisely put out a crowing statement that mentioned the decline in early voting among blacks.) "The very people who talk about the election being rigged, we know they're the riggers," says Reverend William Barber, a civil-rights leader. "We're in a voting war in North Carolina."

Mr McCrory's local challenges have been failing, even though Republicans control the county election boards. But the shenanigans are not over. A right-wing think-tank is suing to postpone the result, citing bogus concerns over voter-registration arrangements. Meanwhile Mr McCrory has requested a recount, to which he is entitled under state law if the margin is fewer than 10,000 votes. That may not be the end of it, either. If an election is contested, North Carolina's legislature may order a rerun—or declare a winner. That proviso has been used once before, in 2005, when the then-Democratic majority decided a state superintendent's race in the Democratic candidate's favour. Even if that nuclear option is not invoked, Mr Cooper's legitimacy will be sullied.

Still, this farrago offers lessons for both parties in how to win, and lose, elections. Mr McCrory did worse than other Republicans in part because of a state law widely thought to discriminate against transgender people and others. After he signed it, some businesses reconsidered their investments, entertainers cancelled concerts and sports tournaments were moved. Mr Cooper resisted the measure; Mr McCrory banked on his supporters' conservatism outweighing the fallout. Evidently he miscalculated: the economic costs, and the broad coalition that mobilised against him, seem to have convinced some Republican-leaning voters to ditch him, even as they plumped for Mr Trump.

True, Republican legislators could have rammed through the law without him. The state is politically divided, but energetic gerrymandering—recently ruled unconstitutional by another federal court—has helped them to secure veto-proof super-majorities in both chambers. That means a Governor Cooper would struggle to restrain them (though, conversely, lawmakers might not be too perturbed by his inauguration). It also means Mr McCrory could not have derailed the transgender bill even if he had wanted to. Rashly, he chose to champion it. Not content with his role in that obloquy, he now seems determined to shame his state by clinging to office. ■

Raleigh pushing it

The next administration

Opening the field

WASHINGTON, DC

Donald Trump has a team of rivals too

THE president-elect's first administration hires had all been middle-aged white men who had backed him to the hilt when others wrinkled their noses. But with a pair of nominations announced on November 23rd he rang the changes. He named Nikki Haley, the Indian-American governor of South Carolina, to be his ambassador to the United Nations, and Betsy DeVos, a billionaire Republican benefactress, as his education secretary. As *The Economist* went to press, he was also reported to have invited Ben Carson, a retired neurosurgeon whom he defeated in the Republican primaries, and who is black, to be his secretary of housing and urban development.

All three possible appointments are intriguing, perhaps Mrs Haley's especially. She is a first-generation American—her parents migrated from the Indian state of Punjab in the 1960s—who converted from Sikhism to Christianity before her marriage, yet still occasionally attends gurdwara. Sparky, personable and, at the age of 44, an acknowledged Republican star, she could be the first Indian-American to hold a cabinet office. She is also a former opponent of Mr Trump's.

She criticised him implicitly last January, when giving the official Republican rebuttal to Barack Obama's last state-of-the-union speech. "It can be tempting to follow the siren call of the angriest voices," she warned: Americans "must resist." She then criticised Mr Trump explicitly after he failed to disavow the support of a former Grand Wizard of the Ku Klux Klan. Having distinguished herself by the alacrity with which she had lobbied to remove the Confederate flag from government buildings the previous year, after a racist massacre of ▸▸

black churchgoers in Charleston, South Carolina, Mrs Haley's condemnation carried moral weight. It is smart of Mr Trump, who once derided her for her criticisms, to try to harness that. Her nomination is evidence that he can in fact bury a grudge. There is speculation he might also be trying to head off a potential challenger in 2020; that would be smart, too.

Mrs DeVos, an heir by marriage to the Amway direct marketing fortune, is another former critic of Mr Trump. She gave money to three of his rivals in the primaries—including Jeb Bush, an establishment figure Mr Trump humiliated—and said the reality television star did "not represent the Republican Party".

In some ways the epitome of the well-heeled Republican elite he railed against on the trail, Mrs DeVos is also a crusader for the pro-choice school reforms, including an expansion of charter schools and vouchers to make private education more widely accessible, he has called for. Amid uncertainty about what Mr Trump means to do with power, given the sketchiness of his platform and his apparent abandonment of a couple of big campaign promises, Mrs DeVos's appointment is a rare clue to a Trump policy agenda. Teachers' unions decried it; Mr Bush, one of Mr Trump's most indefatigable Republican opponents, warmly applauded.

Mr Carson's nomination, if he agrees to it, would be rather odd, but that is now expected of the retired medical whizz. Backed by a devoted following of evangelical Christians, he briefly led the Republican primary field, yet seemed unaware of what the job of president entailed; his brilliant brain seemed resistant to remembering almost any detail of foreign policy. When reported to be in the reckoning for a cabinet role, his business manager said that was the "last thing he would want", because he "feels he has no government experience." This was not a great recommendation for a job that includes responsibility for the federal government's efforts to alleviate urban poverty. ■

Treasure-hunting

The box that launched 100,000 trips

SANTA FE

A valuable hidden treasure draws hopeful hunters out West

IN THE mid-19th century, hundreds of thousands of Americans flocked west in search of gold. Today those with an appetite for treasure head to the Rocky Mountains, where Forrest Fenn, an octogenarian art collector, claims to have hidden a bronze box containing gold coins, Chinese jade, emerald jewellery and other riches, including two gold nuggets "as large as chicken eggs". Mr Fenn first had the idea to stash away the treasure nearly 30 years ago, when he was diagnosed with aggressive kidney cancer and told his chances were slim. Over the decades he spent hawking art to the likes of Steve Martin, an actor, and former President Gerald Ford from his gallery in Santa Fe, New Mexico, Mr Fenn had built up an enviable personal collection of art and artefacts. He decided to pack as much as he could carry and hike to his favourite spot to die. The only way to track him—and his cache—would be to solve the riddle he would leave behind.

Mr Fenn's cancer later vanished, but the idea of hiding the treasure continued to grip him. "When I hid my treasure about six years ago, this country was in a deep recession…I wanted to give some hope to those who were willing to search for the treasure," Mr Fenn explained, sitting in a study lined with shelves crammed with Kachina dolls, beaded moccasins and fore-edge painted books. In 2010, without alerting his wife or daughters, Mr Fenn slipped into the mountains north of Santa Fe, where he lives in an estate of adobe houses, and deposited the bronze box "where warm waters halt". In his memoir "Thrill of the Chase", which was published later that year, he wrote a six-paragraph poem said to contain nine clues indicating where the treasure lies. It concludes: "So hear me all and listen good, your effort will be worth the cold. If you are brave and in the wood I give you title to the gold."

Based on the number who have contacted him, Mr Fenn estimates that up to 100,000 people have thronged to the Rockies in search of his hidden cache over the past six years. Some "Fenn-atics" like Cynthia Meachum, a pensioner who lives in Albuquerque, search almost full-time. Others are more nonchalant about their questing, using Mr Fenn's poem more as a way to give their outdoor exploits a sense of purpose.

Eager to capitalise on interest in Mr Fenn's hidden bounty, the state of New Mexico included the art dealer in one of its promotional videos (it has been viewed 400,000 times on YouTube). Last year the mayor of Santa Fe established a "Thrill of the Chase" day, and in June the city helped promote "Fenn-boree", a weekend-long conference for treasure-seekers. In addition to a potluck dinner and Fenn trivia, the gathering featured something almost as exciting to hunters as ferreting out the coveted bronze box: a cameo appearance by Mr Fenn himself.

The voracity of hope

The national-security team

General direction

Jim Mattis would be a reassuring choice; Mike Flynn is an alarming one

WHAT can be deduced from Donald Trump's confirmed and likely picks for key national security posts? The answer is not much, apart from an apparent enthusiasm for generals—which is slightly odd, given the way Mr Trump lambasted them during the campaign for their failure to win America's wars.

Mike Flynn, a retired military-intelligence general who guided Mr Trump's views on national security throughout his campaign, and whose strident views on Islam were reflected in the candidate's speeches, will be the national security adviser. General Flynn is a divisive figure, who spooks Republican foreign-policy thinkers as much as Mr Trump does. By contrast Jim Mattis, a former Marine general who is likely to be defence secretary, would reassure them; as would David Petraeus, another general, who has been mooted as a potential secretary of state if the job does not go to Mitt Romney. Despite General Mattis's nickname, "Mad Dog" (earned for his aggression in combat and a talent for cheerfully menacing quotes), he is regarded as combining military dash with intellectual seriousness.

Moreover his views, expressed during his time spent as a scholar at the Hoover Institution, a conservative think-tank, con-

No zdorovie

trast with Mr Trump's zero-sum, transactional concept of foreign policy. "Like it or not, today we are part of this larger world and must carry out our part," he said in testimony to the Senate armed services committee in 2015. "We cannot wait for problems to arrive here, or it will be too late; rather we must remain strongly engaged in this complex world."

Generals Flynn and Mattis do have one other thing in common, in addition to their military service. Both were dumped before they were due to retire by the Obama administration. General Mattis was relieved of his command of CENTCOM (which covers an area from the Middle East to Pakistan) in early 2013 without so much as a telephone call from the president. The White House had become riled by his dogged questioning of its Iran policy. Even if the nuclear issue could be resolved, General Mattis argued, not nearly enough was being done to counter Iran's threat to stability in the Middle East.

General Mattis has continued to be a critic of Mr Obama's foreign policy which, he believes, has emboldened Russia, China and Iran, who have exploited the president's reluctance to apply America's military power. If appointed, he would attempt to steer Mr Trump away from isolationism and deals with Vladimir Putin.

Bear hug

General Flynn is likely to push in the opposite direction. "We're in a world war against a messianic mass-movement of evil people, most of them inspired by totalitarian ideology: radical Islam," he wrote in a book published earlier this year. "But we are not permitted to speak or write those two words, which is potentially fatal to our culture." In another passage, he asks: "Do you want to be ruled by men who eagerly drink the blood of their dying enemies?...There's no doubt that they [Islamic State] are dead set on taking us over and drinking our blood." He tweeted in February: "Fear of Muslims is RATIONAL." The tweet included a link to a video claiming that the religion of Islam wants "80% of people enslaved or exterminated". He holds that jihadism is an "existential" threat to America's way of life. Defeating it should, in his view, be the overwhelming national priority, far ahead of meeting the challenge of a rising China or a resurgent, nuclear sabre-rattling Russia.

There are other reasons to worry about the judgment of the man who will be the closest adviser on foreign policy to an inexperienced president, as well as the co-ordinator of the national-security machine. It is troubling that, as a retired senior officer, he joined the chants of "Lock her up, lock her up!" against Hillary Clinton at the Republican convention. He offered support at first for the attempted coup in Turkey, and then changed his mind when his lobbying firm was hired by an outfit linked to the government in Ankara. Last year he accepted payment for attending an event in Moscow to mark the anniversary of RT, a TV network funded by the Kremlin, that included a speech and a seat at Mr Putin's elbow.

General Flynn believes he was fired from his post as director of the Pentagon's Defence Intelligence Agency (DIA) in 2014 because of pervasive political correctness within the Obama White House, which disliked his conflation of Islam with terrorism. It was also infuriated by his insistence that the war against jihadists was being lost, even as Mr Obama was trying to put it behind him.

He was right that the White House claimed victory over al-Qaeda prematurely. And his reorganisation of the DIA, which encroached on the CIA's turf and expensively duplicated its intelligence-gathering, contributed to his downfall. But it is also the case that, where once he had been respected by military contemporaries, such as Stanley McChrystal, General Petraeus and General Mattis, with whom he had helped to redefine counter-insurgency after the initial disasters of the Iraq war, concerns had grown about General Flynn's obsessive behaviour and ill-concealed contempt for civilian control. Insiders claim that he peddled weird theories that came to be known as "Flynn facts".

Were General Flynn to be nominated for a cabinet post requiring congressional confirmation, he would probably struggle. But the job of national security adviser is in Mr Trump's gift. As for General Mattis, under rules devised to ensure civilian authority over the armed forces, a retired military officer is required to be out of uniform for seven years before he could take charge of the Pentagon. However, under the law, Congress can grant a waiver. Widely esteemed and with the enthusiastic backing of the chairman of the Senate armed services committee, John McCain, General Mattis would be a shoo-in. ■

Meet the attorney-general

Evening Sessions

WASHINGTON, DC

Campaigns have consequences

THE nomination of Jeff Sessions as attorney-general is a reminder that words spoken on the campaign trail have meaning, that politics is not show business, and that governments take decisions that make or break lives. The 69-year-old senator from Alabama, one of Mr Trump's earliest supporters and closest adviser from the world of politics, will have sweeping powers over immigration enforcement. If confirmed by the Senate, he will hold in his hands the fate of the 740,000 migrants who arrived as children and were granted the right to stay and work by Barack Obama under the Deferred Action for Childhood Arrivals scheme (DACA).

Mr Sessions has several times sought to pass laws abolishing DACA. He has spent the past decade leading opposition to bipartisan immigration reform bills. He is a sceptic of the H1-B visa scheme that helps companies recruit skilled foreigners, such as scientists or engineers. Mr Sessions has opposed curbs on harsh interrogations for terror suspects (see Lexington) and voted against an attempt to end mandatory minimum sentences for non-violent offences.

As attorney-general Mr Sessions will oversee civil rights and voting rights. As a senator he has opposed calls to restore federal oversight over election laws after the Supreme Court ruled that special monitoring of once-racist states under the Voting Rights Act was no longer needed. The justification for oversight of some states and not others "no longer exists", agreed Mr Sessions in 2014.

Expect Democrats to highlight Mr Sessions's humiliation when he was denied confirmation as a federal judge in 1986. Senators heard a Justice Department official testify that, as US attorney for the Southern District of Alabama, Mr Sessions had suggested that a white civil-rights lawyer might justly be called "a disgrace to his race". Mr Sessions said that he did not recall making that comment, and could not understand why he would have made it, but did not deny his colleague's account. Asked whether he had called the National Association for the Advancement of Coloured People, a civil-rights group, a "pinko" organisation that hates white people, Mr Sessions told his Senate inquisitors: "I am loose with my tongue on occasion, and I may have said something similar to that." Thirty years later, Mr Sessions is in a position to avenge that humiliation.

Lexington | The dark side

Barack Obama has bequeathed his successor fragile legal rules for fighting terrorism

INTERVIEWED by German reporters this month, President Barack Obama was asked whether his failure to close the Guantánamo Bay prison camp, or his drone strikes against terror suspects, marked his presidency's "darkest moment". It was a very European question, of the sort that leaves many American politicians spluttering with impatience. Mr Obama offered a downbeat reply. He expressed pride at ending all use of torture and reducing Guantánamo's population to 60 detainees. He boasted of creating terror-fighting rules that are "much more disciplined and consistent with the rule of law and international norms"—including the obligation to minimise casualties when using drones, while still allowing strikes in countries unable to capture terrorists. He did not boast of leaving Donald Trump a solid legal foundation for using force against Islamic State (IS), because he cannot. Pondering the dilemmas of terrorist-fighting, Mr Obama mused aloud: "How do we make sure that we don't change, even as we protect our people?" He did not answer his own question.

Such ambiguities alarm those who remember the last time America was accused of being a rogue superpower. John Bellinger was chief legal adviser to the State Department from 2005 to 2009 and before that a top lawyer at the National Security Council, putting him at the centre of the toughest Bush-era debates about the war on terror. In a lecture to a high-octane, bipartisan audience at the Supreme Court on November 20th, organised by the Salzburg Global Seminar, Mr Bellinger recalled sharp exchanges with Bush administration colleagues. Hawkish peers objected when he argued that America should not advocate policies that might provide cover for countries like Russia or China to flout international laws on the use of force. They scoffed when he told them that unilateralism risked inflaming public opinion in allied countries. Such colleagues told Mr Bellinger: "It doesn't matter what other countries think; they don't vote for us." But foreigners do get a vote, Mr Bellinger noted: every time they decide whether to share intelligence, extradite suspects or fight alongside Americans. In the Bush era, he recalled, some European spy agencies moved from "co-operation plus", meaning that they offered more information than the CIA requested, to more minimal help. Allies sought assurances that run-of-the-mill criminal extraditions would not see suspects sent to Guantánamo.

In large part because of partisan gridlock on Capitol Hill, the Obama administration's campaign against the fanatics of IS rests on what Mr Bellinger calls "a very strained legal interpretation" of an Authorisation for Use of Military Force (AUMF) from 2001 in which Congress approved military action against al-Qaeda, and a second from 2002 permitting combat in Iraq. Team Obama repeatedly urged Congress to pass a new AUMF, but Republicans called the White House draft too restrictive and Democrats found it too permissive. So Mr Obama's lawyers fell back on arguing that America may fight IS because it is a descendant of al-Qaeda. It may be only a matter of time before an alleged terrorist challenges his detention on the ground that he has no link to al-Qaeda; and at that point lawyers may be left citing a president's powers to defend America, a blunt legal instrument.

Into this confusion marches President-elect Trump. To weigh the risks that he poses to global trust, recall the (unfair) caricature of Bush the Cowboy that stoked such enduring rage in Europe and beyond: namely that for all his talk of promoting democracy, the Texan really started wars to steal Middle Eastern oil, and ordered enemies tortured in a spirit of vengeance. Now consider that this caricature of Mr Bush was Candidate Trump's campaign platform. Mr Trump declared that America should not have invaded Iraq, but once there should not have left without seizing Iraqi oilfields: "You know, it used to be to the victor belong the spoils," he grumbled. At election rallies Mr Trump drew cheers by promising to bring back waterboarding, a mock execution by simulated drowning, and "a hell of a lot worse". Torture works, he asserted, and "if it doesn't work, they deserve it anyway for what they do to us." Trump-defenders often counsel against taking him literally. Sure enough, at a meeting with the *New York Times* on November 22nd, Mr Trump abruptly announced that he now doubts that waterboarding is so useful, after hearing James Mattis, a retired Marine Corps general, say that torture wasn't useful, during an interview for the post of defence secretary.

Europe dusts off the "Wanted" posters

Team Trump contains outspoken advocates of harsh interrogations. Mr Trump's nominee for attorney-general, Senator Jeff Sessions of Alabama, is one of just five senators to oppose a pair of laws on interrogation and torture passed in 2005 and in 2015. With those laws Congress forbade cruel and degrading treatment of detainees, then banned American troops or spooks from using any technique not found in the Army Field Manual on Human Intelligence Collector Operations. Explaining his opposition, Mr Sessions said that sticking to methods in a manual allows the enemy to prepare. Mr Sessions has spoken against granting terrorist detainees the legal rights of criminal suspects, including access to a lawyer. In 2014 Representative Mike Pompeo of Kansas, a Republican named by Mr Trump to head the CIA, condemned a Senate report on CIA interrogations, saying it put "American lives at risk" by revealing techniques that he called "within the law".

Formidable legal and political barriers now exist to anything resembling torture by Americans. But no law stops detainees being sent overseas for questioning. President Trump can undo Mr Obama's drone rules and his ban on the CIA from operating detention sites. Mr Trump has promised to fill Guantánamo with "bad dudes", and seems tempted to let Russia commit war crimes in Syria, in pursuit of IS. If pious appeals do not move the next president, try this. America is a brand. Trash it, and the costs of every global transaction will rise. A dealmaker cannot want that. ■

Also in this section

Brazil's prosperous south

Not the country you know

FLORIANÓPOLIS

Why three southern states have escaped the worst ravages of recession

MAKESHIFT stalls appear on every country road in Brazil, usually laden with bananas and coconuts. On the back roads of Brazil's three southern states—Paraná, Santa Catarina and Rio Grande do Sul—the staple is loops of smoked sausage. Like the garden gnomes that sometimes stand guard, the *Wursts* are a legacy of immigrants from Germany, Poland and other central European countries who, along with northern Italians, settled the region from the mid-19th century.

Southern Brazil, an area the size of France with a population of 29m, feels like a region apart in other ways. Temperatures can drop below freezing on hilly terrain; shacks in poor neighbourhoods of coastal cities are topped with pitched roofs, as if built for snow. Southerners prefer yerba mate tea to *cafezinhos*, and look as much towards Uruguay and Argentina as to the rest of Brazil. Florianópolis, Santa Catarina's capital, has flights to Buenos Aires but not to Belo Horizonte, the capital of Minas Gerais, Brazil's second-biggest state.

These days, the difference southerners most want to talk about is an economic one. Although the region has not been spared the worst recession in Brazil's modern history, its effects have been milder. The south's unemployment rate has doubled to 8% since the recession began in 2014 but remains well below the national average of 11.8%. Sales-tax receipts have kept pace with inflation, a sign of resilient consumption. In São Paulo, Brazil's industrial powerhouse, they have dropped in real terms. This strength has its origins in industrial history, but the region has lessons to teach the rest of Brazil, too.

Southern luck starts with climate and geology. The south is not hospitable to sugar cane and coffee, the commodities that drew Portuguese magnates to Brazil's north-east, where they established an economy based on extraction and exploitation of slave labour. Mineral deposits encouraged concentrations of wealth and power in other regions. Southern farmland, good for such crops as wheat and maize, attracted destitute peasants who purchased smallholdings, which they tilled themselves. Even today, just one in seven farms in Rio Grande do Sul is larger than 80 hectares (198 acres).

Early rigours created a culture of self-reliance. "You had to be entrepreneurial just to survive," explains Santa Catarina's governor, Raimundo Colombo. Traditions of independence and family ownership shape today's business; the south is the centre of Brazil's equivalent of the *Mittelstand*, Germany's medium-sized firms.

Habits of co-operation have been just as important. The south's many credit co-operatives give firms better access to financing than is available in other parts of Brazil. Paraná's Coamo, with 27,000 members, is Latin America's largest agricultural co-operative. Southerners also banded together to educate their children, founding fee-paying "community universities" well beyond the main cities. Chapecó, a town of 180,000 in Santa Catarina's interior, has two such schools.

This history has bequeathed to the region a relatively large middle class and lower inequality than in the rest of Brazil. Its GDP per person is above average. The government's main contribution has been not to squander those advantages. The region's pupils outperform most other Brazilian schoolchildren in international tests. Its governments have imposed less of the enterprise-crushing bureaucracy for which Brazil is famous. Southern states are among Brazil's most competitive. In a ranking by the Economist Intelligence Unit, a sister company of *The Economist*, Paraná and Santa Catarina came second and third after São Paulo; Rio Grande do Sul placed ninth among Brazil's 27 states.

This has helped give the south the sort of economy that Brazil would like to have, one that is diversified and largely independent of the commodity cycle. Extractive industries account for less than 1% of GDP, compared with an average of 4% in Brazil. Manufacturing produces 16-22% of output, compared with 12% nationally.

Foreign investment is boosting the south's manufacturing advantage. BMW, a German carmaker, opened its first Brazilian plant in Santa Catarina two years ago; ▸▸

Renault, a French rival, is spending 740m reais ($218m) to expand one in Paraná.

The lively technology sector is largely home-grown. Florianópolis is one of Brazil's main start-up hubs. Its tech firms pay more in taxes than does the city's well-developed tourist sector. The capital cities of the other two states are close behind.

Many of the region's tech firms grow out of its vocation for farming, fulfilling a Brazilian ambition to build high-value industries on its strengths in natural resources. A start-up in Pato Branco, a tidy city of 80,000 in Paraná's interior, enables drones to map farmland. In Florianópolis, Agriness writes software to monitor the health of 1.6m sows, which produce 80% of Brazil's pork.

Lower-tech firms are also moving up the value chain. In Concórdia, in Santa Catarina's hilly interior, BRF, the world's biggest exporter of chicken, has installed halal production for sales to the Middle East. It has set up a prosciutto smoker for a different clientele: foodies in São Paulo. A nearby unit of Embrapa, a federal agricultural-research institute, developed a breed of pig that produces low-fat meat for such folk. While agriculture accounts for a tenth of southern GDP, such ingenuity raises the share of farm-related industry to half.

Southerners fret that Brazil-wide failings, some of which the region's governments are also guilty of, hold them back. Santa Catarina and Paraná have stabilised their finances, as the federal government is now trying to do. But Rio Grande do Sul has one of the country's biggest deficits. On November 22nd the state followed Rio de Janeiro in declaring a state of "financial calamity", a prelude to seeking federal aid. It is to lay off 1,200 workers and cut salaries.

Infrastructure is not as good as it should be. The 460km (286-mile) journey from Concórdia to Florianópolis can take 11

Bello | Piñata politics

With an unfriendly neighbour, Mexico needs to strengthen itself

ALMOST 25 years ago a Mexican president, Carlos Salinas, took a historic decision. He decreed that his country's future lay in setting aside its fear and resentment of its mighty neighbour to the north and embracing economic integration with the United States through the North American Free-Trade Agreement (NAFTA). The agreement underpinned the modernisation of part of Mexico's economy. So the imminent arrival in the White House of Donald Trump, a critic of NAFTA who threatens to build a migrant-blocking wall between the two countries, looks like a disaster for Mexico.

It would be easy to say that Mr Salinas made the wrong bet, as his many critics charged at the time. He didn't. For Mexico, geography is destiny. Anyway, with $1.4bn in goods crossing the border each day, the country's economy is now inextricably bound to that of the United States. So what is Mexico to do? Today's president, Enrique Peña Nieto, who was excoriated when he invited Candidate Trump to visit, trusts that he can interest President Trump in a "modernisation" of NAFTA. He has some leverage: Mexican non-co-operation on trade, drugs and migrants could hurt the United States.

No democratic ally deserves the insults that Mr Trump directed at Mexico. But they have prompted introspection as well as anger. Mexico became "the easy piñata" of Mr Trump's campaign because of its own failings, wrote Jesús Silva Herzog, a commentator, in *Reforma*, a newspaper. "The slamming of the door to the north leaves us, once again, face to face with ourselves."

Mr Peña is right when he insists that not everything in Mexico is going badly. But many big things are. NAFTA has functioned as a legal exoskeleton, offering certainty to foreign investors. Domestic investors have no such luck. That is a big reason why economic growth has averaged less than 3% since 1990. Mexicans are fed up with out-of-control crime and what Mr Silva Herzog calls the "the permanent scandal of our public life". Eight former state governors, all but one from Mr Peña's Institutional Revolutionary Party (PRI), face corruption charges, having left their states with debts totalling $9bn. Only one is in jail.

The central problem that Mexico has evaded is that of governance. The country has only flourished when it has had a strong central government, albeit at the cost of liberty. That applied under Porfirio Díaz for more than 30 years until he was toppled by revolution in 1911. It applied again in the heyday of the PRI's one-party system. With the defeat of the PRI in elections in 2000, Mexico gained political freedoms, but not the rule of law or accountable government, as Luis Rubio, a political scientist, explains in an essay for the Wilson Centre, a think-tank in Washington.

The power once monopolised by the PRI presidents is now shared with state governors and with the two main opposition parties. But there are still no checks and balances on its exercise, as the larceny of governors illustrates. And government is ineffective: Mr Peña has been unable to implement fully some of the reforms he enacted at the start of his term. If he thought the PRI's old method of central command would work in a more sophisticated country, he has been disabused. He is widely reviled: his approval rating is only 25%.

If he wants to rescue his reputation he should use the remaining two years of his term to deal with the problem of governance, in two ways. First, he could appoint a genuinely independent attorney-general—an essential first step to establishing the rule of law. His government pushed through a law to grant autonomy to the office from 2018, but with the proviso that the incumbent would continue in the job for another nine years. His critics' fears that the change will be merely cosmetic were raised when last month Mr Peña appointed Raúl Cervantes, a PRI senator and formerly the party's lawyer, to the job. That is not good enough.

Second, he needs to tackle the declining legitimacy of politics and the presidency. Mr Peña was elected with just 38% of the vote. Because of growing political fragmentation, his successor may need only 25% or so. Whoever it is will find governing hard, unless Mexico introduces a run-off vote between the two front-runners in the presidential election, as most Latin American countries have.

Mr Peña has the negotiating skills to pull off these reforms. But does he have the will? Porfirio Díaz is once supposed to have exclaimed of his country: "Poor Mexico, so far from God and so close to the United States." Today, its misfortune is that it is so close to Mr Trump and so far from good governance.

hours by lorry. The region's governors admit they should work together more, especially on lobbying the federal government to improve roads and build railways.

Employers in the countryside fear a "rural exodus" that could hurt agribusiness in the long run, says Rafael Menute, who runs BRF's operation in Concórdia. The south's rural population has dropped from 18% of the total to 14% over the past decade. To encourage people to stay, the company is paying its 1,200 suppliers more. Pato Branco's mayor, Augustinho Zucchi, has paved rural roads to make it easier for farmers' children to reach the town's night spots.

In the cities entrepreneurs worry about the costs of success. Everton Gupert, co-founder of Agriness, frets that rising property prices will drive graduates out of Florianópolis. Juliano Froehner, a serial entrepreneur whose latest venture is a service to remind parents to take their infants for health check-ups, spends ten days a month in the city of São Paulo. That is because it is still the biggest centre of finance and talent. But even self-satisfied *paulistanos* no longer ask him why he spends the rest of his time in the south. ■

Indigenous rights in Canada

Contested wilderness

OTTAWA

A case in the Supreme Court pits skiers against the grizzly-bear spirit

THE Ktunaxa First Nation, an indigenous group in south-eastern British Columbia, believes that the grizzly-bear spirit resides in a sacred part of the Purcell mountains that they call Qat'muk. For 25 years they have resisted a scheme to build a ski resort in this wilderness. On December 1st the Ktunaxa will bring their fight to Canada's Supreme Court. They will argue that their religious freedom takes precedence over the right of mountain-bombing masses to experience the deep powder for which the area is famed.

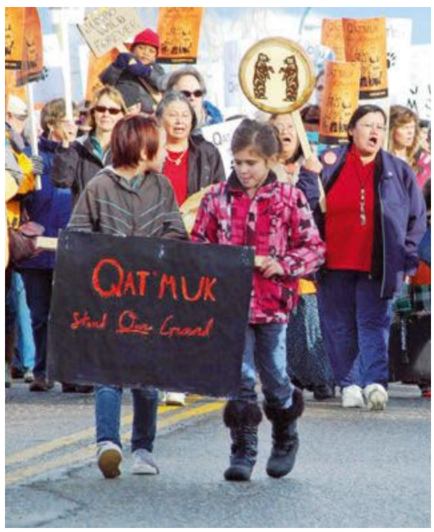
The case will set a precedent in Canada and reverberate abroad. Sacred sites are an issue in protests against the Dakota oil pipeline in the United States. New Zealand's government recently conferred the rights of a person on a national park sacred to the Maori people. Canada's Supreme Court has ruled before on indigenous people's rights over land use, but never on the basis of their religious beliefs.

The nature of that faith, which assigns sacred value to features of the landscape, poses a puzzle for the courts. The Ktunaxa maintain that skiers will drive away the grizzly-bear spirit, making their rituals meaningless. Canada's Supreme Court must now decide whether that danger represents an infringement of the religious freedom established by the constitution, and whether that infringement is justified.

The Ktunaxa lost the first two rounds of legal tussling. Lawyers for Glacier Resorts, which is developing the project, say the Ktunaxa informed them only in 2009 that the site was sacred. They point out that the Shuswap First Nation, which settled near the sacred area in the 1850s, supports the resort, which will bring employment. British Columbia's appeals court rejected the argument that the Ktunaxa do not hold their beliefs very strongly. But, it ruled, their faith may not restrict use of land by people who do not share it.

The appeal to the Supreme Court has prompted 14 outside groups to file friend-of-the-court briefs. Religious organisations, such as the Muslim Lawyers Association, argue for a broad interpretation of religious rights. The Chamber of Commerce wants a narrow one.

Such groups worry that a decision in favour of the Ktunaxa will set off an avalanche of similar claims. There might be thousands of sacred sites in Canada. These fears are exaggerated, says Michael Lee Ross, a lawyer in Vancouver who has written a book on sacred sites and the courts. The Supreme Court is accustomed to setting limits on the rights guaranteed by the constitution, he says. Whatever its decision on the grizzly-bear spirit, skiers will find new mountains to conquer. ■



The day the grizzlies have their protest

Polish-Brazilians

Black soup and pierogi

ÁUREA, RIO GRANDE DO SUL

A minority remembers its roots, but forgets its language

ÁUREA, a town in the northern part of Rio Grande do Sul, calls itself the "Polish capital of Brazilians". To a visitor, it is the Slavic personality that comes through at first. The children tumbling out of school are mostly fair-haired. Wheat and thickets of pine cover the surrounding hills. An occasional palm tree is the only sub-tropical feature.

Áurea makes the most of its Polishness. More than 90% of its 4,000-odd residents say their origins are in the central European country. It hosts an annual *czernina* festival; last year 1,000 people came to savour the black soup thickened with duck blood.

But ties with the mother country are loosening. Although Polish can still be overheard on the street, mass was last celebrated in the language three years ago, reports Artêmio Modtkowski, in Portuguese-inflected Polish. His grandfather, Jan, was among the 12 founders of the settlement in 1906. Despite appearances, Áurea's inhabitants are as Brazilian as members of the other groups that make up the country's ethnic mishmash.

Some 60,000 Poles, mostly impoverished peasants, landed in Brazil between 1869 and 1920. Nearly all went to Paraná, another southern state. Its capital, known to Poles as Kurytyba (and to everyone else as Curitiba), is the only city in South America that has a polonised name. From there the newcomers spread throughout Brazil's south to raise crops and breed livestock.

Perhaps 800,000 Brazilians, less than 0.5% of the population, are of Polish descent, though the number could be higher. They include Jews who fled Europe during and after the second world war and settled mainly in cities. In Higienópolis, an upper-middle-class neighbourhood in São Paulo, delis sell Polish *pierogi* (dumplings) and herring.

Poles and their descendants have made less of a splash in politics than have other Brazilians with Slavic roots. Juscelino Kubitschek, who as president from 1956 to 1961 moved Brazil's capital from Rio de Janeiro to Brasília, was of Czech origin. The father of Dilma Rousseff, Brazil's leader from 2011 until she was impeached in August this year, was Bulgarian. Polish-Brazilians have been more prominent in culture. Zbigniew Ziembinski, who died in 1978, is regarded as the father of modern Brazilian theatre.

But Polish-Brazilians are beginning to make a bigger mark in public life. Ricardo Lewandowski, the chief justice of Brazil's supreme court, presided over Ms Rousseff's impeachment trial.

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Counter-terrorism

The eyes in Africa's skies

NIAMEY

America has been revving up its efforts against a range of terrorist groups

THE capital of Niger is not known as a hotspot for planespotters. But passengers waiting to take off at Niamey's airport are sometimes in for a treat: the sight of an American Predator drone elegantly gliding down ahead of them on its only runway. If they take off and look out of the window, they will see a generously sized base with new-looking hangars and several American transport aircraft.

It is not the only sign of America's presence in Niamey. The embassy is unusually large; the city's best restaurants buzz with American accents. And now, at Agadez, an ancient desert city in the north of the country, that is a transit point on the route to Europe, mixed in with the smugglers and migrants are contractors from Europe and South Africa, quietly building another base for drones. Niger, a desperately poor country on the edge of the Sahara—in the semi-arid region known as the Sahel—with a population of some 20m, has become a key location for America's expanding security presence in West Africa. It is a sign of growing worries about jihadism in the region and of America's stepped-up efforts to contain it. But the local effects of importing Western might are not always benign.

American involvement in the Sahel began in earnest in 2005 with the Trans Sahara Counter-Terrorism Initiative. In 2007 the Pentagon launched AFRICOM, its military command for Africa. Since then, the number of special forces operatives active in Africa has risen sharply; on average around 700 are deployed there. In the western Sahel region drones also fly from a base in Chad, while small surveillance planes operated by contractors have flown from Burkina Faso and Mauritania. America is not the only country with operations in Niger; France, the former colonial power, also has a base there and Germany is building one too (which it says will be for logistics only).

The focus on Niger makes sense. The country is at the centre of several conflicts. In the north-west Mali's Islamist insurgency has spilled over the border. On 14th October, an American aid worker was kidnapped; a week before that, 22 of Niger's soldiers were killed in an attack on a refugee camp. In the south-east, near Lake Chad, over the past few months Boko Haram's insurgency against the Nigerian government has pushed thousands of refugees into Niger's Diffa region. And from the north and north-east, weapons and fighters from Libya threaten to destabilise a region already known for violent uprisings, particularly from the Toubou and Tuareg desert tribes.

Islamist attacks, year to October 31st 2016
AQIM and affiliates; ISIS; Unidentified/unaffiliated Boko Haram
Source: Africa Centre for Strategic Studies

The worry is that these conflicts will link together, or already have. "There is a big split in American policy on understanding it as a globally connected jihadi group or not," says Brandon Kendhammer, of Ohio University. In the Pentagon it is generally thought that it is, he says; but officials in the State Department often think the opposite. While a part of Boko Haram has claimed allegiance to Islamic State, the evidence of practical links to the jihadists' operations in Libya is thin: a few Nigerian fighters (not necessarily from Boko Haram) have turned up in Libya, but that is about it.

If there is more evidence to be collected, however, the Pentagon is sure to get it. The Predator and Reaper drones at the base in Niamey may look intimidating, but they are used for surveillance, not launching strikes. Though details about the new base at Agadez are scarce, it is thought that it will play a similar role. In recent years drones have replaced surveillance flights flown by civilian aircraft out of bases in places like Burkina Faso. But that they are not carrying missiles does not mean missiles are not being fired by others. And in 2013, for example, when France launched a military offensive to push back Islamist Tuareg fighters in Mali (some affiliated with al-Qaeda) they probably benefited from extensive American intelligence.

So what is the effect of all this security co-operation? It seems to be helping to contain violent Islamism. Niger, unlike Mali, has not fallen victim to a major insurgency ▸▸

in the north since the early 1990s. A short rebellion in the late 2000s was quickly put down. In the Lake Chad region, while Boko Haram have launched attacks on Niger's army, they do not control territory in the way they do in neighbouring Nigeria (where co-operation with Western forces is far more fraught).

As a result, aid agencies are able to operate, which means that displaced people are not starving. In the Diffa region, the Red Cross distributes food and water to tens of thousands of refugees who have fled fighting from across the border in Nigeria and built shanty towns on the edges of the highway, guarded by soldiers in smart uniforms with American-style camouflage.

Yet there are reasons to worry about America's presence, too. Though a staunch ally of the West, Niger's president, Mahamadou Issoufou, is no exemplary democrat. He was re-elected in February, but only after the opposition boycotted the second round of the vote. His main opponent was locked up and then fled the country for exile abroad.

Ali Idrissa, a Nigerien journalist and political activist, says that Mr Issoufou has no legitimacy. "We have a super rich political class and a mass of people who have been abandoned." He sees security co-operation with America as a way for the elite to hold on to power. "Why are the bases here? The sovereignty of Nigeriens has been sold. This is about the rich making more money and staying in power, not about protecting our territory." On the streets of Agadez, it is not unusual to see "*Dégage, la France*!" (get out, France) scrawled on walls. Critics say the West is only interested in Niger's uranium, whose proceeds accrue mainly to the well-connected.

Political resentment helps fuel the Islamists—who also thrive on anger at the way war is conducted (it is suggested that a ban on motorbikes in Diffa has helped Boko Haram recruit, for example). Much of Niger's territory is hot, dusty and infertile. Conditions are worsening because of climate change. Almost a third of its imports are covered by aid. Security co-operation is one of the few things its government can offer. Against an Islamist insurgency across West Africa, it is a useful ally. But government repression also helps fuel insurgency. And as long as the money keeps flowing, it has little reason to change its ways. ■

East African camels

Speedy and tasty

KASSALA, SUDAN

The camel trade is increasingly lucrative

"ALLAHU akbar!" the boys shout gleefully from atop their camels, the reins of others held in their raised fists, their backs to the setting sun. Beside them a metal-fenced racing track cuts through the pancake-flat desert. Every dawn and dusk the camels are trained to run on this plain outside Kassala, a city in eastern Sudan. Their owners hope they will catch the eye of the wealthy Emiratis who visit several times a year to buy the fastest mounts for multimillion-dollar prize races in Dubai.

The Rashaida, a tribe that migrated to Sudan and Eritrea from Saudi Arabia in the mid-19th century, are renowned for breeding some of the world's speediest racing camels. They are also infamous for trafficking Eritreans who cross the border, around 30km (20 miles) from Kassala, in the hope of eventually reaching Europe. Emiratis buy between 100 and 300 young camels a year from the village of Abu Talha, some for as much as $80,000, says Hamed Hamid, a mustachioed patriarch. There are around 800 racing beasts in a settlement of 1,200 people, he estimates, and many more are being raised for slaughter. "The camels are everything. They give us milk, meat and trade," Mr Hamid says, as his wife brews tea and coffee over hot coals under a starry sky.

Although the Rashaida are traditionally nomadic, many have settled in villages like Abu Talha, a jumble of earthen-walled or brightly painted concrete houses. They have also adapted to the United Arab Emirates' ban on child jockeys, after the state was censured by the UN in 2005. Boys still train some camels, but others are whipped along by miniature robots dressed in jockey silks and given orders remotely from white Toyota pickup trucks.

Each month the villagers sell around 200 baby camels to Saudi Arabia and 120 adult ones to Egypt for human consumption, says Mr Hamid, pointing out a large female that will fetch as much as 25,000 Sudanese pounds ($1,525 at the black-market exchange rate). Livestock is a big and growing business all over east Africa, in considerable part fuelled by the Gulf's increasing appetite for meat. Live Sudanese animal exports more than trebled to $670m between 2010 and 2013 (the most recent years for which the World Bank has data). More than 70% were sheep, demand for which surges around the Muslim festival of Eid al-Adha, when they are ceremonially slaughtered. In 2015 Somalia sold 5.3m animals, worth $384m; livestock counts for 40% of that fractured country's GDP.

Other Sudanese may sneer that the Rashaida's new cars and houses have been bought with the proceeds of people-smuggling. But there is plenty of money to be made in the legitimate business of exporting livestock.

I've got a lovely one here

South Africa

Rainbow stagnation

JOHANNESBURG

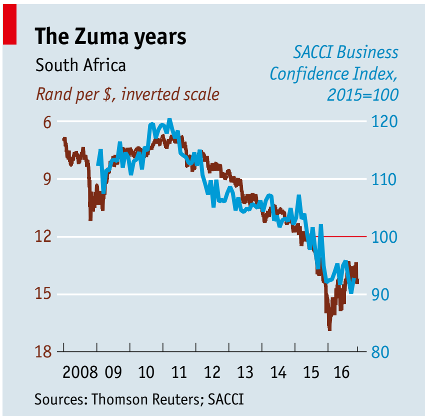
Business and government are pulling in opposite directions on growth

THE sprawl of cranes around Sandton, South Africa's swanky financial district, and a dearth of empty beds in Cape Town, its tourist Mecca, point to an economy that shows some signs of rebounding from a deep slump earlier this year. Taken individually many indicators are buoyant: good rains mean that farmers are likely to plant 35% more maize this year; a weak rand has encouraged a 20% jump in the number of international tourists.

Yet add these numbers up and the equation still turns out badly: the economy will be lucky to limp in with growth about 0.5% this year and will not do very much more than 1.5-2% over the next few years. This is a percentage point or two below the long-run trend rate of 3%.

So what explains this black hole in the economy? The answer is almost entirely poor governance by Jacob Zuma, a president who may soon face 783 charges of fraud, corruption and racketeering.

Foolish policies play a part. Take tourism. Although the number of holidaymakers has soared, the government itself reckons that there ought to have been many more bottoms on South African ▸▸



beaches. Thousands have been turned away by absurdly strict rules requiring families to carry birth certificates for their children. But corruption is also hurting the economy. A recent report by an ombudsman revealed details of how the government and Eskom, the state-owned power monopoly, muscled an international mining company into selling a coal mine to friends of the president.

The effect of mismanagement and corruption is best seen in measures of business confidence and the currency, both of which have plummeted since the start of Mr Zuma's presidency in 2009 (see chart). Investment has fallen to 20% of GDP from 23% over the same period.

With growth so slow, credit-rating agencies fret that the country may struggle to repay its debts. Moody's, which in May said it was minded to cut its rating, was due to deliver a verdict on November 25th. Standard and Poor's, which rates the country's debt one notch above junk, will give its assessment a week later. Some 80% of economists polled by Bloomberg, a news agency, expect the ratings firms to downgrade South Africa in the next year.

The threat of a rating cut is prompting feverish attempts to open up the economy by Pravin Gordhan, the respected finance minister. On November 20th the deputy president, Cyril Ramaphosa, announced a new national minimum wage of 3,500 rand ($247) a month in a bid to get unions to agree to labour-law reforms that would make it harder for them to call strikes of the sort that shut down the country's platinum mines for almost half of 2014. The chief executives of major banks are also involved in efforts to liberalise the economy by, among other things, getting big firms to agree to hire hundreds of thousands of youngsters on one-year internships. "In the last year South Africa's reformist voices have been ascendant," says Goolam Ballim, an economist at Standard Bank. "After almost a decade of political and economic drift, 2016 may yet prove to be the inflection point...in confidence and investment." But without better leadership, such optimism is likely to prove short-lived. ■

Dissent in the Gulf

Protest and lose your passport

To silence dissidents, Gulf states are revoking their citizenship

SINCE the small Gulf states became independent from Britain in the latter half of the 20th century, their ruling families have sought fresh methods to keep their subjects in check. They might close a newspaper, confiscate passports or lock up the most troublesome. Now, increasingly, they are stripping dissidents, and their families, of citizenship, leaving them stateless.

Bahrain is an energetic passport-stripper. Its Sunni royals have dangled the threat of statelessness over its Shia majority to suppress an uprising launched in 2011, during the Arab spring. In 2014 it deprived 21 people of their nationality. A year later the number was up tenfold. Last year the spiritual leader of Bahrain's Shias, Isa Qassim (pictured) lost his. "Gulf rulers have turned people from citizens into subservient subjects," says Abdulhadi Khalaf, a former Bahraini parliamentarian whose citizenship was revoked in 2012 and now lives in Sweden, as a citizen there. "Our passports are not a birthright. They are part of the ruler's prerogative."

Neighbouring states are following suit. Kuwait's ruling Al-Sabah family have deprived 120 of their people of their nationality in the past two years, says Nawaf al-Hendal, who runs Kuwait Watch, a local monitor. Whereas, in Bahrain, most of those targeted are Shia, Kuwait's unwanted are largely Sunni. Ahmed al-Shammari, a newspaper publisher, lost his citizenship in 2014.

In 2015 a Saudi jihadist blew himself up during Friday prayers in Kuwait, killing 27 Shias. A crackdown followed, targeting the many Saudi Salafists suspected of obtaining Kuwaiti nationality in the chaos after the ejection of Iraqi forces from Kuwait in 1991. "We're looking for frauds," says General Mazen al-Jarrah, a member of the ruling family responsible for the emirate's Citizenship and Residency Affairs.

The socially more liberal United Arab Emirates does it too. Fearful of unrest orchestrated by the Muslim Brotherhood, the UAE has revoked the citizenship of some 200 of its people since 2011, says Ahmed Mansoor, a human-rights activist now under a travel ban.

The most enthusiastic stripper of all in the Gulf is Qatar. It revoked the citizenship of an entire clan—the Ghafrans—after ten clan leaders were accused of plotting a coup together with Saudi Arabia in 1996. Over 5,000 Ghafrans have lost their nationality since 2004. Many have since won a reprieve, but thousands remain in limbo, says Misfer al-Marri, a Ghafran who is now exiled in Scotland.

The consequences can be severe. Summoned to hand over their ID cards and driving licences, individuals lose not just the perks that come with citizenship of an oil-rich state, such as cushy jobs, but the ability to own a house, a car, a phone or a bank account. Those abroad are barred from returning. Those inside the country ▸▸

You can check out any time you like, but you can never leave cannot leave. The stateless cannot register the birth of a child or legally get married. They may find a sponsor and apply for residents' permits as foreigners, but if refused they are liable to be arrested for overstaying. "It's a legal execution," says one Bahraini, who still has his citizenship. "They're left without rights."

Rulers say they are waging war on terrorism. Among the 72 who lost their Bahraini citizenship in January 2015 were 22 alleged members of Islamic State. But by blurring the boundary between peaceful and violent dissidents, the authorities risk turning the former into the latter. Laws which once permitted the removal of citizenship only for treason (or if people acquired a second nationality) are now much broader. Defaming a brotherly country, for instance, can cost you your passport in Bahrain. The penalty also applies to "anyone whose acts contravene his duty of loyalty to the kingdom" or who travels abroad for five years or more without the interior ministry's consent. Victims include academics, lawyers, former MPs, their wives and young children.

Westerners are not in any position to lecture others, retort Gulf autocrats. Most EU states revoke citizenship for reasons other than fraudulent applications, in particular for involvement in terrorism. Britain, for instance, does it if it is conducive to the "public good". Before becoming prime minister, the then-home secretary, Theresa May, did it 33 times. "Everyone has the right to a nationality," says Article 15 of the Universal Declaration of Human Rights. Sadly, not everywhere. ■

Libya

The unravelling

CAIRO

A Western-backed deal to salvage Libya is falling apart

WHEN Fayez al-Serraj returned to Libya in March the situation looked unusually hopeful. For two years, rival governments in the east and west of the country had fought over a disputed election. In December representatives from both sides of the country (but not their leaders) agreed to a UN-backed peace proposal. Powerful players in the war withheld their support, but they could be brought in later, said advocates. The deal, known as the Skhirat agreement after the Moroccan town in which it was signed, empowered Mr Serraj (pictured), then a relatively unknown politician, to form a government of national accord (GNA). His smooth arrival in Tripoli, the capital, in March seemed to herald a brighter future.

The worst job in the world?

It has not turned out that way. The new government, though ostensibly backed by some powerful militias, has failed to gain broad support. The eastern parliament, called the House of Representatives (HOR), has refused to approve the body, as required under the Skhirat agreement. Remnants of the old government and legislature in the west, known as the General National Council (GNC), unsuccessfully attempted a coup in Tripoli last month.

Far from ending the Libyan conflict, the Skhirat deal has reconfigured it, says a new report from the International Crisis Group, a think-tank in Brussels. "A year ago, the conflict was between rival parliaments and their associated governments; today it is mainly between accord supporters and opponents, each with defectors from the original camps and heavily armed."

Neither side is satisfied with the agreement, which left security questions unanswered. Indeed, the HOR's position stems in large part from its fear that Khalifa Haftar, the commander of the Libyan National Army, the biggest armed group in the east, would be sidelined under the deal.

The conflict looks likely to escalate. In September Mr Haftar captured several oil facilities along the coast. Now a hodgepodge of militias, most of them Islamist, are readying to fight him there and in cities such as Derna and Benghazi.

The GNA's defence ministry is said to be co-ordinating with the anti-Haftar forces, but most of the militias that support the government, many hailing from Misrata, do not plan to take part in the fight. They and others are still trying to push the jihadists of Islamic State (IS) out of Sirte, on the coast.

The outside world had hoped the battle against IS would encourage unity. But even western Libya remains divided. A number of the groups fighting IS do not recognise the GNA, which many Libyans see as beholden to the Misratans, or as a puppet of the UN. The support the GNA does receive is fickle and based mainly on self-interest. It has only a tenuous grip on its own capital, where armed groups operate without control. Some changed sides last month and participated in the attempted coup. Mr Serraj still holds his meetings at a heavily-guarded naval base, not the prime minister's office.

Foreign countries, many of which pushed for the Skhirat agreement, have added to the discord. Libyans feel that the West, which supports the GNA, has neglected local concerns while fighting terrorists and trying to stem the flow of refugees across the Mediterranean Sea. Some in the West also appear to be working with Mr Haftar on these issues. The general receives weapons—and, perhaps, air support—from Egypt and the United Arab Emirates, and advice from Russia. His supporters hope Donald Trump, America's president-elect, will also take their side, though he has not expressed much interest in Libya.

The GNA, for its part, has done little to win over the public. Services are sporadic at best, while the economy is teetering. Under Mr Haftar, at least, more oil is flowing from the facilities along the coast, with revenues going to the central bank. But the government has feuded with the bank over funding and economic policy (there is none, says Saddek al-Kabir, the head of the bank). Under Western pressure, the government has promised to publish an economic plan by December 1st, and the bank will give $6bn to the government.

Mr Haftar's fate is perhaps the biggest question hanging over Libya. Popular in the east and parts of the west, he may seek to follow the path of Abdel-Fattah al-Sisi, who crushed Egypt's Islamists as head of the army and then shed his uniform to run for president. Many supporters of the Skhirat agreement are convinced that Mr Haftar will never compromise or lay down his arms. But they still think it best to push on with the imperfect deal in hand.

After five years of upheaval, most Libyans want the fighting to stop. The ICG and others have called for new talks, this time involving people, such as Mr Haftar, who can actually influence events on the ground. The West, though, is being stubborn. "The UN and international community continue to insist [the Skhirat agreement] is the only option, when everyone realises this is not going to work," says Mohamed Eljarh of the Atlantic Council, a think-tank in Washington. "There is a lack of creativity in terms of solutions." ■

The Economist

SPECIAL REPORT

OIL

November 26th 2016

Breaking the habit

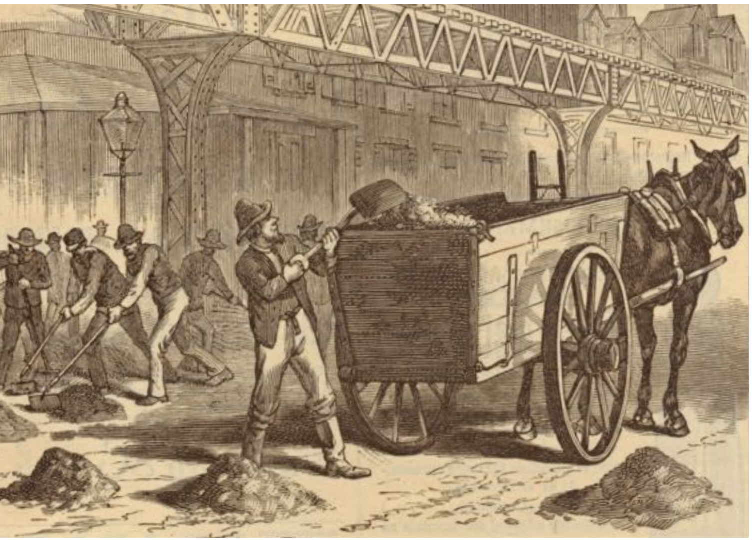
Breaking the habit

The world's use of oil is approaching a tipping-point, writes Henry Tricks. But don't expect it to end imminently

CONTENTS

AT THE TURN of the 20th century, the most malodorous environmental challenge facing the world's big cities was not slums, sewage or soot; it was horse dung. In London in 1900, an estimated 300,000 horses pulled cabs and omnibuses, as well as carts, drays and haywains, leaving a swamp of manure in their wake. The citizens of New York, which was home to 100,000 horses, suffered the same blight; they had to navigate rivers of muck when it rained, and fly-infested dungheaps when the sun shone. At the first international urban-planning conference, held in New York in 1898, manure was at the top of the agenda. No remedies could be found, and the disappointed delegates returned home a week early.

Yet a decade later the dung problem was all but swept away by the invisible hand of the market. Henry Ford produced his first Model T, which was cheap, fast and clean. By 1912 cars in New York outnumbered horses, and in 1917 the last horse-drawn streetcar was retired in Manhattan. It marked the moment when oil came of age.



That age has been one of speed and mostly accelerating progress. If coal drove the industrial revolution, oil fuelled the internal-combustion engine, aviation and the 20th-century notion that mankind's possibilities are limitless; it flew people to the Moon and beyond. Products that have changed lives—from lipstick to CD players, from motorcycle helmets to aspirin—contain petrochemicals. The tractors and fertilisers that brought the world cheaper food, and the plastics used for wrapping, are the progeny of petroleum products.

Oil has changed history. The past 100 years have been pockmarked with oil wars, oil shocks and oil spills. And even in the 21st century its dominance remains entrenched. It may have sped everything else up, but the rule of thumb in energy markets is that changing the fuel mix is a glacial process (see chart, next page). Near its peak at the time of the Arab oil embargo in 1973, oil accounted for 46% of global energy supply. In 2014 it still had a share of 31%, compared with 29% for coal and 21% for natural gas. Fast-growing rivals to fossil fuels, such as wind, solar and geothermal energy, together amounted to little more than 1%.

Horses for courses

Yet the transition from horse power to horsepower, a term coined by Eric Morris of Clemson University, South Carolina, is a useful parable for our time. A hundred years ago oil was seen as an environmental saviour. Now its products are increasingly cast in the same light as horse manure was then: a menace to public health and the environment.

For all its staying power, oil may be facing its Model T moment. The danger is not an imminent collapse in demand but the start of a shift in investment strategies away from finding new sources of oil to finding al-

ACKNOWLEDGMENTS

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A list of sources is at **Economist.com/specialreports** ternatives to it. The immediate catalyst is the global response to climate change. An agreement in Paris last year that offers a 50/50 chance of keeping global warming to less than 2°C above pre-industrial levels, and perhaps limiting it to 1.5°C, was seen by some as a declaration of war against fossil fuels.

That agreement has been thrown into doubt by the election of Donald Trump, who has dismissed climate change as a "hoax", as America's next president. But if big energy consumers such as the EU, China and India remain committed to curbing global warming, all fossil fuels will be affected. The International Energy Agency (IEA), a global forecaster, says that to come close to a 2°C target, oil demand would have to peak in 2020 at 93m barrels per day (b/d), just above current levels. Oil use in passenger transport and freight would plummet over the next 25 years, to be replaced by electricity, natural gas and biofuels. None of the signatories to the Paris accord has pledged such draconian action yet, but as the costs of renewable energy and batteries fall, such a transition appears ever more inevitable. "Whether or not you believe in climate change, an unstoppable shift away from coal and oil towards lower-carbon fuels is under way, which will ultimately bring about an end to the oil age," says Bernstein, an investment-research firm.

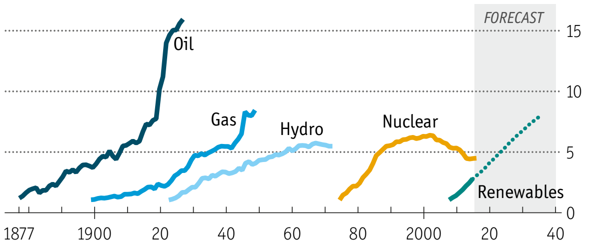
Few doubt that the fossil fuel which will suffer most from this transition is coal. In 2014 it generated 46% of the world's fuel-based carbon-dioxide emissions, compared with 34% for oil and 20% for natural gas. Natural gas is likely to be the last fossil fuel to remain standing, because of its relative cleanliness. Many see electricity powered by gas and renewables as the first step in an overhaul of the global energy system.

This special report will focus on oil because it is the biggest single component of the energy industry and the world's most traded commodity, with about $1.5trn-worth exported each year. Half of the Global *Fortune* 500's top ten listed companies produce oil, and unlisted Saudi Aramco dwarfs them all. Oil bankrolls countries that bring stability to global geopolitics as well as those in the grip of tyrants and terrorists. And its products fuel 93% of the world's transport, so its price affects almost everyone.

Since the price of crude started tumbling in 2014, the world has had a glimpse of the havoc a debilitated oil industry can cause. When oil fell below $30 a barrel in January this year, stockmarkets predictably plummeted, oil producers such as Venezuela and Nigeria suffered budget blowouts and social unrest, and some American shale companies were tipped into bankruptcy. But there have been positive effects as well. Saudi Arabia has begun to plan for an economy less dependent on oil, and announced it would partially privatise Aramco. Other Middle Eastern producers have enthusiastically embraced solar power. Some oil-consuming countries have taken advantage of low oil prices to slash fuel subsidies.

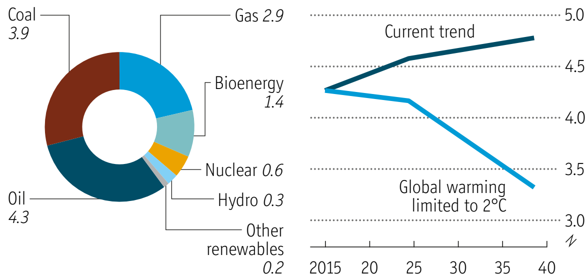
Ready for the next take-off?

Share of global primary-energy consumption, %
First 50 years after reaching 1%



Source: BP

The big picture



Source: International Energy Agency

Western oil companies have struggled through the crisis with a new cross to bear as concerns about global warming become mainstream. In America the Securities and Exchange Commission and the New York attorney-general's office are investigating ExxonMobil, the world's largest private oil company, over whether it has fully disclosed the risks that measures to mitigate climate change could pose to its vast reserves. Shareholders in both America and Europe are putting tremendous pressure on oil companies to explain how they would manage their businesses if climate-change regulation forced the world to wean itself off oil. Mark Carney, the governor of the Bank of England, has given warning that the energy transition could put severe strains on financial stability, and that up to 80% of fossil-fuel reserves could be stranded. The oil industry's rallying cry, "Drill, baby, drill!" now meets a shrill response: "Keep it in the ground!"

Which peak?

This marks a huge shift. Throughout most of the oil era, the biggest concern has been about security of energy supplies. Colonial powers fought wars over access to oil. The Organisation of Petroleum Exporting Countries (OPEC) cartel was set up by oil producers to safeguard their oil heritage and push up prices. In the 20th century the nagging fear was "peak oil", when supplies would start declining. But now, as Daniel Yergin, a Pulitzer-prize-winning oil historian, puts it: "There is a pivot away from asking 'when are we going to run out of oil?' to 'how long will we continue to use it?'" For "peak oil", now read "peak demand".

Oil to fuel heavy-goods vehicles, aeroplanes and ships, and to make plastics, will be needed for many years yet. But from America to China, vehicle-emissions standards have become tougher, squeezing more mileage out of less fuel. Air pollution and congestion in big cities are pushing countries like China and India to look for alternatives to petrol and diesel as transport fuels. Car firms like Tesla, Chevrolet and Nissan have announced plans for long-range electric vehicles selling, with subsidies, for around $30,000, making them more affordable. And across the world the role of energy in GDP growth is diminishing.

Analysts who think that the Paris accords will mark a turning point in global efforts to reduce carbon-dioxide emissions say global oil consumption could start to wane as early as the 2020s. That would mean companies would have to focus exclusively on easy-to-access oil such as that in the Middle East and America's shale-oil provinces, rather than expensive, complex projects with long payback periods, such as those in the Arctic, the Canadian oil sands or deep under the ocean.

Yet many in the industry continue to dismiss talk of peak demand. They do not believe that governments have the political will to implement their climate goals at anything like the speed the Paris agreement envisages. In America they ridicule the idea that a nation built around the automobile can swiftly abandon petrol. And Khalid Al-Falih, Saudi Arabia's energy minister, estimates that the world will still need to invest in oil to the tune of almost $1trn a year for the next 25 years. Oil veterans point out that even if global oil consumption were to peak, the world would still need to replace existing wells, which deplete every year at the rate of up to 5m b/d—roughly the amount added by America's shale revolution in four years. Demand will not suddenly fall off a cliff.

A number of big oil companies accept that in future they will probably invest less in oil and more in natural gas, as well as in renewable energy and batteries. Rabah Arezki, head of commodities at the IMF, says the world may be "at the onset of the biggest disruption in oil markets ever".

This report will argue that the world needs to face the prospect of an end to the oil era, even if for the moment it still seems relatively remote, and will ask three central questions. Will the industry as a whole deal with climate change by researching and investing in alternatives to fossil fuels, or will it fight with gritted teeth for an oil-based future? Will the vast array of investors in the oil industry be prepared to take climate change on board? And will consumers in both rich and poor countries be willing to forsake the roar of a petrol engine for the hum of a battery? ■

Producers

On the oil wagon

The industry is already suffering upheaval, but part of it is in denial

SOME CALL IT "Texarabia". In Midland, West Texas, every bare 40-acre plot of land appears to have a pumping unit on it, drawing oil from the shale beds of the Permian Basin up to 12,000 feet (3,700 metres) below. One is toiling away in the car park of the West Texas Drillers, the local football team. The Permian Basin Petroleum Museum, on the edge of town, has an exhibition of antique "nodding donkeys" dating back to the 1930s. In a lot behind them a working one is gently rising and falling.

Drive 20 miles north, though, and the pumpjacks are overshadowed by hundreds of wind turbines whirring above them (see picture, next page). In fields of cotton, shimmering white in the early-autumn sun, it is a glimpse of the shifting contours of the energy landscape.

You might think hardened oilmen would resent the turbines pointing the way to a future when the world no longer needs fossil fuels. But Joshua Johnson, who manages a string of oil leases in the area and proudly shows your correspondent the lustrous crude he stores in 500-barrel oil batteries, sees things differently, saying: "I think these new technologies are a wonderful thing." In his view, renewable energy will be a vital complement to oil as the world's demand for energy increases. But he dismisses global warming: "It's always been hotter 'n hell here."

The Permian Basin is oil's latest frontier, and it is in the throes of a mini-investment boom, despite the deepest downturn in the oil market since the 1990s. The number of rigs has increased by 60% since May, whereas in other shale basins in America it has crept up only slightly. The hydraulic fracturing, or fracking, from wells that are drilled is picking up; around Midland the sight of big red lorries gathered around a wellbore like circus wagons, pumping in fluid and sand at high pressure, has become more familiar again (though the amount of drilling is still less than half its level at the peak in 2014).

So far this year Wall Street has provided funding of more than $20bn to American oil companies, mostly to acquire assets and frack them in the Permian. Some think that the prospects have been overhyped, but not Scott Sheffield, boss of Pioneer Natural Resources, one of the area's largest producers. He reckons that the Permian, made up of many layers of oil-bearing rock 250m years old, may have as much recoverable oil as Saudi Arabia's Ghawar field, source of more than half the kingdom's oil riches. That is probably wishful thinking, but it suggests that morale in America's oil industry is recovering after the price crash.

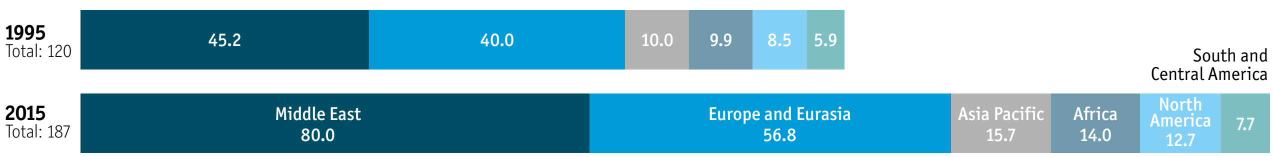
The Permian's story is an example of how a mixture of luck, geology, technology, law and true grit can keep on delivering oil in copious quantities. Such discoveries appear to settle the industry's perennial question about how soon the stuff will run out. In his recent book, "Market Madness: A Century of Oil Panics, Crises and Crashes," Blake Clayton catalogues four eras when the world panicked about "peak oil". The first was the emergence of the motor car, when oil prices started to soar. The second coincided with the second world war. The third was in the 1970s, when OPEC drove up the price of oil. The fourth began in the mid-2000s as oil began its rise to $140 a barrel. Yet the Jeremiahs have always been proved wrong. M. King Hubbert, the doyen of peak-oilers, predicted back in 1956 that global oil supply would never exceed 33m b/d. It is currently 97m b/d. According to BP, a British oil company, proven global oil reserves have risen by 50% in the past 20 years, and at current rates of production would last about 50 years (see chart).

Too much of a good thing

As concerns about climate have risen, policymakers, regulators and investors have switched from worrying about a potential oil shortage to fretting about a possible glut. In the most extreme scenarios, experts say that if there is to be a 50/50 chance of keeping global warming below 2°C, only 35% of proven fossil-fuel reserves (mostly coal and oil) can be burned. If the target limit is to be 1.5°C, only 10% of the proven reserves can be used. As Mr Clayton writes: "Oil will be outmoded long before the

Still a world of plenty

Proven oil reserves by region, trn m³



Source: BP

Putting the wind up oil

world's oil wells run dry."

Pioneer's Mr Sheffield agrees, which makes him a heretic among his American peers. He reckons that global demand for oil may peak within the next 10-15 years because of slow global growth and the large-scale introduction of electric vehicles powered by renewable energy. To prepare for that day, he says, Pioneer is considering selling assets elsewhere in America to focus on the Permian, which he argues is cheap enough to compete in a world of dwindling oil demand.

Like Pioneer, some larger, integrated oil companies, especially European ones, are changing their bets on oil's future, mostly because of the recent collapse in the oil price. For instance, Royal Dutch Shell, the Anglo-Dutch supermajor, pulled out of the Arctic because drilling there would be too expensive. Its French counterpart, Total, is unwilling to invest more in Canada's oil sands, for similar reasons. But they are also aware that if demand goes into long-term decline, those with the cheapest oil will survive longest. Simon Henry, Shell's chief financial officer, says the company expects a peak in oil demand within the next 5-15 years. It intends to concentrate on what it sees as the cheapest deepwater reserves in places like Brazil where investments can be recouped within that time frame. It may also cut oil exploration. Total, too, is hoping to find low-cost oil. It has bought a small stake in a 40-year oil concession near Abu Dhabi, in the expectation that Gulf oil will always be cheap.

Largely because the most prolific reserves are in the hands of OPEC countries, and hence difficult for Western firms to get hold of, some oil majors are turning to gas as a complement to oil (see chart). This year Shell completed a $54bn acquisition of BG, a British producer of natural gas and oil, bringing gas close to half its energy mix. Oilmen say the gas business is more complex than oil; it needs more upfront capital to develop, pipelines for transport and new systems of delivery, so returns can be lower. Yet even the most pessimistic scenarios for the future of fossil fuels suggest better growth prospects for gas than for oil.

Belt and braces

Some companies are also taking out options on renewable technologies, in case they grow very quickly. Total has bought battery and solar-power businesses, though its boss, Patrick Pouyanné, insists that without profits from oil and gas it would not have been able to do so. Shell's Mr Henry says his company's business model may increasingly resemble that of sovereign-wealth funds such as Norway's, which redirect the substantial cashflows from oil into lower-carbon technologies. Britain's BP, which pioneered the concept of "Beyond Petroleum", only to rue it later because its solar-power investments failed to make money, is gingerly considering investing more in wind for the first time in five years. When the nature of the energy transition becomes clearer, these companies say they may have to invest tens of billions of dollars to develop new energy businesses.

Philip Whittaker of the Boston Consulting Group (BCG) notes that in the past oil projects have been cash machines, because the value of an extra barrel of oil can vastly exceed the cost of production. The difference gets smaller as reserves become harder to find, but investors still like the industry's relatively high risk-return profile. Once an oil firm has covered the costs of developing a field, it can sometimes generate cash for decades.

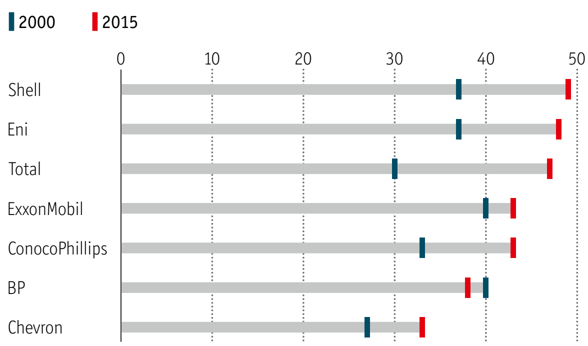
He says it is not clear that investing in renewables could replicate oil's risk-return profile. The oil companies have huge balance-sheets and make commensurately large capital investments, but in the short term it is hard to see renewables reaching sufficient scale to become important parts of their business. Perhaps installing large quantities of offshore wind turbines in deep and rough seas would be similar to deep-sea oil drilling. But the more that the oil companies come to resemble electricity companies, the more their risk profile looks like that of a dull utility. They would also have to get involved with their consumers, which is not something this engineering-minded industry could get excited about.

On a much bigger scale, the Saudi government hopes to pursue a similar diversification strategy via an initial public offering of part of Saudi Aramco. Some of the proceeds, estimated at up to $150bn, will be put into a massive sovereign-wealth fund that will invest in technologies beyond oil. Some reckon that the kingdom has recently been producing oil at record levels because it is expecting an early end to the oil age. Others think it simply wants to recoup market share from other producers.

In America, meanwhile, many oil companies seem to want to keep their heads down. Some argue that market forces are better at reducing emissions than co-ordinated action by governments. The displacement of coal by shale gas, they point out, has cut emissions to ten-year lows. Many hope that the recent investment drought in the industry will lead to shortages that will send the oil price rocketing before the end of this decade. But that, says BCG's Mr Whittaker, could be the oil market's "last hurrah", giving a final push to electrification. ■

Gasified

Natural gas as % of total energy production



Source: Bloomberg

Investors

Taken to task

Oil companies need to heed investors' concerns

IN SEPTEMBER 2015, at a candlelit dinner at Lloyd's of London, Mark Carney, the governor of the Bank of England, addressed the insurance industry on climate change. He gave warning in advance that there would be no jokes. Then he dropped a bombshell on the oil industry.

His message was twofold. First, if the world seriously intended to limit global warming to 2°C, most of the coal, oil and gas reserves in the ground would be left "stranded", or unrecoverable. Such "transition risk" could jeopardise financial stability, he argued. Second, a task force would be set up to prompt companies to disclose how they planned to manage risks and prepare for a 2°C world, similar to the one created to improve risk disclosure by banks after the financial crisis.

Ever since that speech, oil companies have been incensed by the idea that they may be the next Lehman Brothers. Ben van Beurden, chief executive of Royal Dutch Shell, talks of financial regulators trying to "weaponise financial markets against oil and gas". Patrick Pouyanné, the boss of Total, has urged Mr Carney to "take care of the pound, not the oil industry".

But Mr Carney's remarks presaged a change in attitude towards oil companies by governments, financial regulators and investors that has become clearer since the Paris climate-change agreement last December. The Securities and Exchange Commission, America's stockmarket regulator, is investigating whether ExxonMobil, the country's biggest oil company, values its untapped reserves appropriately in light of the recent halving of oil prices and potential regulatory action on climate change. In October it said it might write down about one-fifth of its reserves. The company has faced related probes by New York's attorney-general, Eric Schneiderman.

If measures to stop global warming are fully implemented, oil-company revenues could fall by more than $22trn over the next 25 years

Activist shareholders have had unprecedented support from mainstream investors for their efforts to force oil companies to explain how their businesses would be changed by full-scale decarbonisation. Total, Shell and BHP Billiton, a coal and oil company, were ahead of the field, issuing reports in the past 12 months that outlined scenarios for a move to 2°C warming.

American oil firms prefer to dig in their heels, arguing that market forces are a better way to reduce emissions than "international accords or government initiatives". They note that thanks to the shale-gas revolution in America, emissions last year were 12% lower than a decade earlier. Such attitudes risk causing more of a backlash towards the most resistant companies. BlackRock, a big asset manager, estimates that more than 500 investment firms, with assets of $3.4trn under management, have pledged to divest from fossil-fuel companies. It says that when financial fiduciaries decide where to invest, they should now consider the climate impact as well as the likely returns.

Bevis Longstreth, a former SEC commissioner (and climate activist), says such exhortations can have a ripple effect throughout the investment community. Local governments are beginning to unwind their oil and gas investments. It reminds him of the rush to disinvest from big companies that traded with South Africa under apartheid in the 1980s. "It's like getting out of the theatre when you smell smoke."

Stranded by guesswork

Yet the industry's tetchy reaction to the questions raised over the value of its reserves is partly justified. Mr Schneiderman's probe of ExxonMobil has cast this way and that, like a wildcatter desperately looking for oil. Because oil prices go up and down so much, estimating and valuing reserves is fiendishly hard. It is even harder to predict what regulators might do to counter climate change.

As for Mr Carney's worry about stranded assets, the industry argues that it is premature. Countries like Saudi Arabia may have reserves estimated to last 70 years, but oil companies' proven reserves are much shorter-range, typically 10-15 years. IHS, a research firm, estimates that about 80% of the value of most listed oil companies is based on proven reserves that will be used within that time frame. Daniel Yergin, IHS's vice-chairman, also points out that the recent collapse in oil prices posed no threat to the stability of the financial system, even though the shock was more abrupt than climate change is likely to turn out. He thinks Mr Carney has overstepped the mark.

All the same, the industry may come under further pressure. Under the aegis of the Financial Stability Board (FSB), a body administered by the Group of 20 that monitors the global financial system (and is chaired by Mr Carney), the Task Force on Climate-related Financial Disclosures is drawing up global guidelines, due to be presented to the FSB in December, for voluntary disclosure on how to manage climate risks. Members of the task force acknowledge that these risks may be tricky to account for on the balance-sheet, especially as it is not clear what future regulations governments will impose. IHS argues that such rules could harm fossil-fuel companies by putting off lenders and giving an advantage to state-owned rivals that would not face the same pressures from investors.

One of the advisers to the task force, Mark Lewis, of Barclays, says that if measures to stop global warming are fully implemented, oil-company revenues could fall by more than $22trn over the next 25 years, more than twice the predicted decline for the gas and coal industries combined. Mr Lewis sees a cautionary tale in the woes of European utilities, hit by government action to penalise coal and nuclear power. They have suffered such a devastating collapse in their share prices in recent years that some of the biggest, including Germany's E.ON, have been forced to split off their fossil-fuel businesses. If the big oil companies are encouraged to discuss climate-change risks openly, they will have a better chance of avoiding such a fate. ■

Transport

From oiloholics to e-totallers

What changes in driving habits and improved batteries might do to oil demand

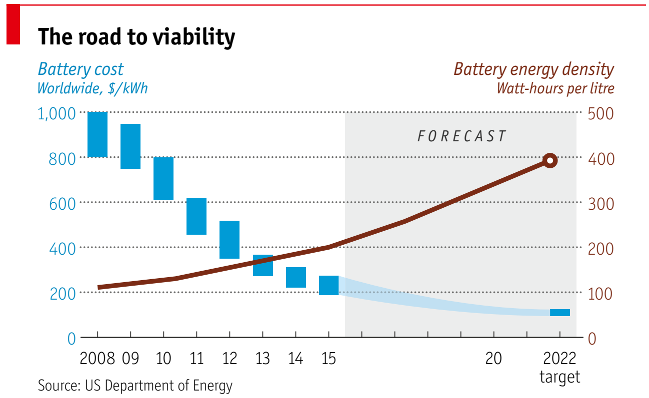
IT HAS BEEN a bad couple of years for those hoping for the death of driving. In America, where cars are an important part of the national psyche, a decade ago people had suddenly started to drive less, which had not happened since the oil shocks of the 1970s. Academics started to talk excitedly about "peak driving", offering explanations such as urbanisation, ageing baby-boomers, car-shy millennials, ride-sharing apps such as Uber and even the distraction of Facebook.

Yet the causes may have been more prosaic: a combination of higher petrol prices and lower incomes in the wake of the 2008-09 financial crisis. Since the drop in oil prices in 2014, and a recovery in employment, the number of vehicle-miles travelled has rebounded, and sales of trucks and SUVs, which are less fuel-efficient than cars, have hit record highs.

This sensitivity to prices and incomes is important for global oil demand. More than half the world's oil is used for transport, and of that, 46% goes into passenger cars. But the response to lower prices has been partially offset by dramatic improvements in fuel efficiency in America and elsewhere, thanks to standards like America's Corporate Average Fuel Economy (CAFE), the EU's rules on CO_2 emissions and those in place in China since 2012.

The IEA says that such measures cut oil consumption in 2015 by a whopping 2.3m b/d. This is particularly impressive because interest in fuel efficiency usually wanes when prices are low. If best practice were applied to all the world's vehicles, the savings would be 4.3m b/d, roughly equivalent to the crude output of Canada. This helps explain why some forecasters think demand for petrol may peak within the next 10-15 years even if the world's vehicle fleet keeps growing.

Occo Roelofsen of McKinsey, a consultancy, goes further. He reckons that thanks to the decline in the use of oil in light vehicles, total consumption of liquid fuels will begin to fall within a decade, and that in the next few decades driving will be shaken up by electric vehicles (EVs), self-driving cars and car-sharing.



America's Department of Energy (DOE) officials underline the importance of such a shift, given the need for "deep decarbonisation" enshrined in the Paris climate agreement. "We can't decarbonise by mid-century if we don't electrify the transportation sector," says a senior official in Washington, DC. It is still unclear what effect Donald Trump's election will have on this transition.

In a recent paper entitled "Will We Ever Stop Using Fossil Fuels?", Thomas Covert and Michael Greenstone of the University of Chicago, and Christopher Knittel of the Massachusetts Institute of Technology, argue that several technological advances are needed to displace oil in the car industry. Even with oil at $100 a barrel, the price of batteries to power EVs would need to fall by a factor of three, and they would need to charge much faster. Moreover, the electricity used to power the cars would need to become far less carbon-intensive; for now, emissions from EVs powered by America's electricity grid are higher than those from highly efficient petrol engines, say the authors.

My kingdom for a cheap battery

They calculate that at a battery's current price of around $325 per kilowatt hour (kWh), oil prices would need to be above $350 a barrel for EVs to be cost-competitive in 2020. Even if they were to fall to the DOE's target of $125 per kWh, they would still need an oil price of $115 a barrel to break even. But if battery prices fell that much, oil would probably become much cheaper, too, making petrol engines more attractive. Even with a carbon tax, the break-even oil price falls only to $90 a barrel.

Those estimates may be too conservative, but the high cost ▸▸

Horseless evolution

Beyond lithium-ion

The next generation of batteries needs to be miles cheaper

DON HILLEBRAND, AN American motor-industry veteran, has an intriguing job. In a warehouse at the secure Argonne National Laboratory, which arose from the University of Chicago's work on the Manhattan Project, he scrutinises foreign-made cars, trucks and lithium-ion batteries to discover their technological secrets and share them with his employer, the Department of Energy, and its friends in the Big Three car companies.

His engineers have dismantled the engine of a new Honda model to lay bare its energy-saving technologies and then "reverse-engineered" it to make sure they have fully understood them. They do something similar with lithium-ion batteries, though they rarely dismantle them completely. When they do, it is in an explosion-proof room, Mr Hillebrand chuckles.

Much of the science behind those batteries originally came from America (ironically, the labs of ExxonMobil, America's biggest oil company), but it was Japan's Sony that first commercialised them in 1991. America is now in a race to catch up with Japan and South Korea, the two front-runners, though China is also a strong competitor. "The Asians are ten years ahead of us," says Mr Hillebrand.

Steve LeVine, in his book "The Powerhouse", describes the contest as "the great battery war". Winning it could not only revolutionise transport, it could cause the biggest oil crisis of all time. America has emerged victorious from some skirmishes; for instance, Argonne scientists developed the nickel-cobalt-manganese cathode used in the plug-in hybrid Chevy Volt. But the DOE's loyalties are split because, as well as wanting to develop batteries that could put the oil industry out of business, it also has other energy industries to nurture, notably oil and natural gas.

Mr Hillebrand believes it may still be decades before batteries dislodge oil from the energy mix, especially if oil prices stay low. (One of his senior scientists, Amgad Elgowainy, drives a Volt, but says that with petrol at $2 a gallon, he prefers filling it up with fuel rather than charging it.)

Yet in a different department at Argonne, known as JCESR (Joint Centre for Energy Storage Research), scientists are trying to go beyond lithium-ion to make batteries five times more energy-dense (meaning smaller and lighter) at one-fifth the cost. Scientists test different materials for anodes, cathodes and electrolytes and run their findings through numerous discharging and recharging cycles in an effort to produce safer and more efficient batteries.

George Crabtree, JCESR's director, says one of the current favourites is a lithium-sulphur battery, though more work is needed on the number of charging cycles it can endure. The aim is to come up with an EV battery, whether lithium-based or not, at a cost below $100 a kilowatt hour, which would power a car that sells for $20,000. Despite Tesla's efforts, he doubts that lithium-ion can deliver the goods. "With the present low oil price you have to get to an even lower battery price to become transformative," he says. Some also worry that production of lithium (pictured) in South America and elsewhere may be insufficient to support a transport revolution. But fears of peak lithium may be as premature as those of peak oil.

of batteries and their short range help explain why EVs still make up only 0.1% of the global car fleet (though getting to 1m of them last year was a milestone). They are still mostly too expensive for all but wealthy clean-energy pioneers. Many experts dismiss the idea that EVs will soon be able seriously to disrupt oil demand. Yet they may be missing something. Battery costs have fallen by 80% since 2008, and though the rate of improvement may be slowing, EV sales last year rose by 70%, to 550,000. They actually fell in America, probably because of low petrol prices, but tripled in China, which became the world's biggest EV market.

Next year Tesla aims to bring out its more affordable Model 3. It hopes that the cost of the batteries mass-produced at its new Gigafactory in Nevada will come down to below $100 per kwh by 2020 (see chart, previous page), and that they will offer a range of 215 miles (350km) on a single charge.

Countries that have offered strong incentives to switch to EVs have seen rapid growth in their use. Norway, for instance, offers lower taxes, free use of toll roads and access to bus lanes. Almost a quarter of the new cars sold there are now electric (ample hydroelectricity makes the grid unusually clean, too).

This bodes well for future growth, especially if governments strengthen their commitment to electrification in the wake of the Paris accord. The Electric Vehicles Initiative (EVI), an umbrella group of 16 EV-using nations, has pledged to get to 20m by 2020. The IEA says that to stand a 50/50 chance of hitting the 2°C global-warming target, there would need to be 700m EVs on the road by 2040. That seems hugely ambitious. It would put annual growth in EV sales on a par with Ford's Model T—at a time when the car industry is also in a potentially epoch-making transition to self-driving vehicles.

But imagine that the EVI's forecast were achievable. By 2020 new EV sales would be running at around 7m a year, displacing the growth in sales of new petrol engines, says Kingsmill Bond of Trusted Sources, a research firm. Investors, focusing not just on total demand for oil but on the change in demand, might see that as something of a tipping point. As Mr Bond puts it: "Investors should not rely on the phlegmatic approach of historians who tell them not to worry about change." ■

India and China

Different drinking habits

Energy-consumption patterns in Asia will not replicate those in the West

HYDROCARBONS CAN STILL make the heart race—especially if you are short of them. That is evident under a sweltering midday sun on the outskirts of Noida, an Indian boomtown adjacent to New Delhi, where hundreds of poor women, clad in bright saris, recently gathered for a celebration. They were marking what Narendra Modi's government hopes will be the beginning of the end for an age-old poverty trap: collecting firewood and cow dung for cooking.

The women say they, and often their children too, spend hours every day hunting for firewood. They risk being troubled by snakes and predatory men and miss out on opportunities for more productive work. Studies cited by the government suggest that half a million Indian women die each year as a result of respiratory illnesses caused by inhaling noxious smoke. So the public has responded enthusiastically to a campaign this year to use $1.3bn, part of a windfall from the drop in the price of oil (of which India imports 81% of its needs), to provide it with cleaner-burning subsidised liquefied petroleum gas (LPG).

Dharmendra Pradhan, the petroleum minister, says more than 10m middle-class Indians have responded to a "GiveItUp" campaign and volunteered to transfer their small LPG subsidy to a mother living below the poverty line. Within three years he aims to supply LPG to 50m poor households. He calls it "energy justice", and it looks like a vote-winner, though delivering LPG reliably across India's vast hinterland will be hard.

The oil industry will lap up the story. After all, the IEA says that India, which currently consumes less energy per person than Africa, will become the engine of global growth in oil demand by the mid-2020s as its economy grows and its population becomes the biggest in the world.

China, too, will keep rigs drilling across the globe. Over the past decade it has accounted for 60% of the world's growth in oil consumption, helping to push up prices until they collapsed in 2014. Though Chinese growth will slow and the oil intensity of both China's and India's economy will decline, the IEA, in forecasts that assume the 2°C global-warming target will not be met, reckons that by 2040 China will consume 4.1m b/d more than it does now, and India 6m b/d.

Other emerging markets are also expected to consume more oil as economic growth boosts demand for mobility and petrochemicals. There is plenty of scope to reduce energy poverty. Bernstein, the research firm, says that rich countries, on average, consume 10-25 barrels per person per year, compared with 1-3 barrels per person in poorer countries. It predicts that the global vehicle fleet will double from 1bn to 2bn over the next 25 years, mostly thanks to rising income per person in developing countries, which is expected roughly to offset the drop in demand for petrol in the West. Demand for diesel to power trucks in emerging markets will continue to rise. So will the use of kerosene for aircraft: in both China and India the number of journeys by air is soaring.

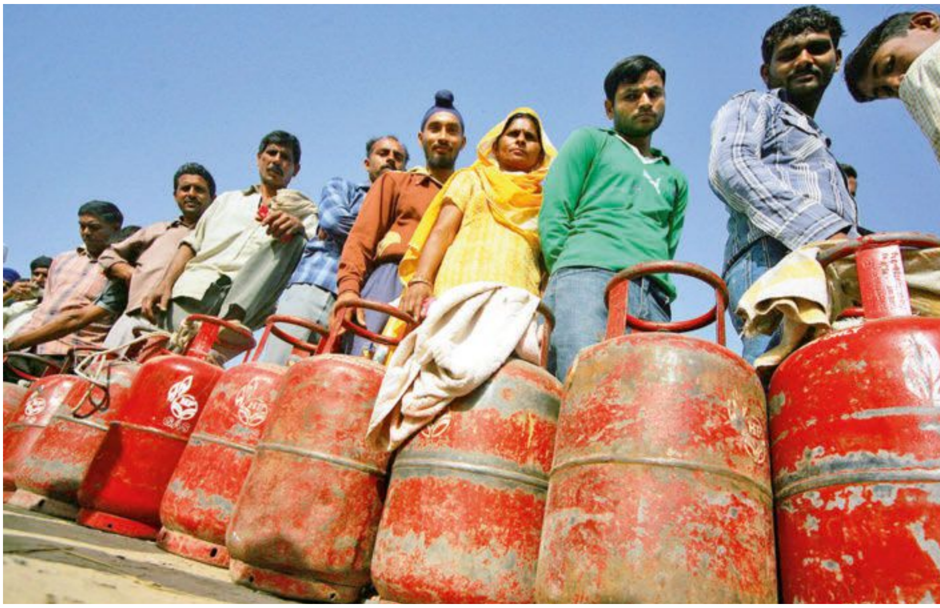
Yet the industry's prospects in developing countries may not be as uniformly rosy as they appear. India's early development was built on the railways. Its car fleet, at less than 20 vehicles per 1,000 inhabitants, is paltry—about the same as America's at the time of the first world war. When asked if India's energy consumption will follow the same pattern as in rich countries, Mr Pradhan bridles: "Why should we do things the same way as other countries? Why should we think the car is the only form of transportation? We want to develop our own model."

In both India and China, air pollution and congestion in the biggest cities are already appalling, which will limit the scope for a richer population to buy ever more cars. Moreover, China's climate-change commitments, laid out in pledges in advance of the Paris summit last year, indicate a desire to lead efforts to reduce global warming. India has at least signalled that it will take part, though hesitantly.

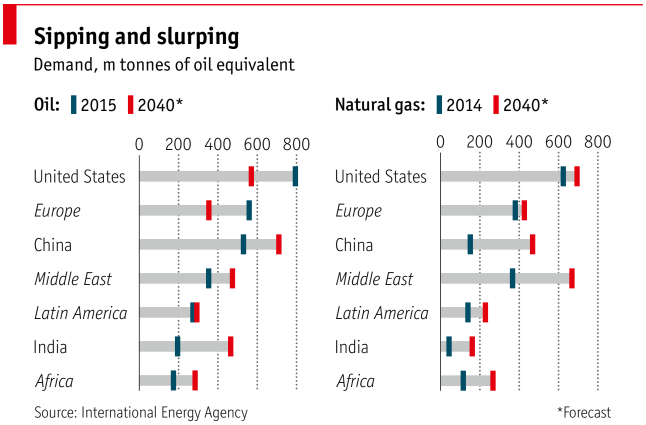
King Coal's long arm

India still relies on coal for 58% of its primary energy needs. It hopes to reduce its dependence on oil (28% of the mix) by 10% by 2022, and plans to double the share of natural gas from 7% to 15%. It intends to rely increasingly on liquefied natural gas (LNG) instead of oil. Within six years it aims to more than double its capacity to turn LNG back into piped gas, and has plans to lay 15,000km of new gas pipelines. Civil servants in the petroleum ministry (one of a handful of fuel ministries) talk of turning India into a gas-based economy. But that sounds futuristic, given that cheap coal underpins power generation in India, and its use is expected to keep on growing.

The government hopes to deploy gas as an alternative to oil-based products in transport as well as for power generation, though this plan may suffer a knock if gas prices rise, which they eventually will. The change of direction is already visible on the streets of New Delhi. All public transport, taxis, rickshaws and many private cars have been converted to compressed natural gas (CNG), which is cheaper and cleaner than diesel or petrol. ▸▸



Better than cow dung



The drawback is long queues at petrol stations, because a tank of CNG takes a long time to fill and there are not enough pumps.

The government is also developing LNG as an alternative to diesel in long-distance trucking, working with Tata, the country's largest conglomerate, says Mr Pradhan. In the meantime it plans to use bamboo and other natural products to produce biofuels such as ethanol to blend with petrol. In recent years it has scrapped subsidies for petrol and diesel, and by 2020 it hopes to tighten up the fuel-efficiency standards for the country's vehicle fleet. All this will be hard to pull off, but suggests that India's demand for oil may be more constrained than the industry hopes.

On your electric bikes

It is a similar story in China. Though car sales rose by a whopping 24m in 2015, density, at about 120 vehicles per 1,000 people, is still up only to America's in the 1920s. So the demand for oil is bound to rise, but the pattern of consumption will change. Wang Tao, of the Carnegie-Tsinghua Centre for Global Policy in Beijing, says sales of petrol will balloon even though new cars are becoming more efficient, vehicle-emissions standards are getting stricter and some cities are imposing tighter curbs on buying new cars to keep down pollution and congestion. At the same time diesel, used in industry and for road freight, is slumping as the economy moves towards services and light manufacturing.

Like India, China is promoting LNG for long-distance buses and lorries and CNG for light vehicles. Growth in the use of both fuels suffered a sharp slowdown last year as oil prices fell, but is expected to recover. Mr Wang says the biggest problem in developing the gas market in China is that the pipelines are owned by state-owned monopolies, which bars private companies from moving in and offering more competitive prices.

On the streets of big Chinese cities, the most eye-catching development is the surge in electric bikes, which cause far less congestion than cars and hardly any pollution, though their owners' traffic etiquette is as poor as that of any car driver. (Delhi, not to be outdone, has acquired a new fleet of e-rickshaws). The IEA puts the number of electric bikes in China at 200m, nearly double the number of cars. They cater for workers who cannot afford cars, and overcome a problem that many public-transport users in big cities face: a long walk to and from the station.

Mr Wang says one of their attractions is that, unlike electric cars, the government has not promoted them. They represent an innovative, free-market approach to a blue-collar problem. The downside is that city authorities in Beijing and elsewhere are cracking down on them and even considering bans, because they see them as a nuisance for cars and pedestrians. ■

The future

Into the twilight zone

A glimpse of a post-oil era

STEWART SPENCE WAS a young hotelier in Aberdeen in 1971 when he first realised what an oil rush meant. His hotel, the Commodore, was the only one in the Scottish city with en-suite bathrooms. One day an American oil executive strode in, wearing denims, cowboy boots and a stetson. Once assured that the bedrooms had private facilities, he booked 20 rooms for six months and paid upfront by banker's draft. The American, boss of an oil-services company called Global Marine, was ferrying three oil rigs from the Gulf of Mexico to Aberdeen. Thus began Scotland's North Sea oil boom. Steak houses, cigars and words like roughneck and roustabout took hold. Texans famously drank Dom Pérignon champagne out of pint mugs. They lived the high life until oil prices crashed in 1986. Then they disappeared almost as swiftly as they had come, says Mr Spence.

Since those days oil has brought both boom and bust to Aberdeen, but never before the sense of despondency that grips the city today. In 2012 it had more multi-millionaires per 100,000 people than London and the world's busiest heliport, taking workers to and from the rigs. But the oil-price crash in 2014 drove home the fact that after almost half a century of exploitation, many of Aberdeen's offshore fields have become too expensive to be sustainable. The number of jobs has plummeted, and some oil producers are on the brink of bankruptcy.

As the world enters what could be the twilight of the oil age, some wonder whether Aberdeen's travails could be a harbinger of things to come in oil-producing regions across the world. Mr Spence thinks so. He still runs the smartest hotel in Aberdeen and is about to install a charging station for electric vehicles.

Not so fast, say many oil-industry veterans. They accept that high-cost oil regions like Scotland's North Sea, Canada's oil sands and the Russian Arctic may be in trouble, but expect at least one more oil boom, born from the ashes of today's bust, because there has been so little investment in the past two years to open up new sources of supply. Within the next couple of years, they think the market will once again swing from glut to shortage. The biggest beneficiaries will be producers in places with low-cost, abundant oil such as the Middle East, America's Permian basin, Brazil's pre-salt fields and parts of west Africa. But although those regions may see a boom in investment, it would be short-lived, because long-term demand is falling and the market could quickly become oversupplied.

After dark

When it comes, what might a terminal decline in the use of oil mean for the industry, governments and the world at large? The biggest turmoil would be felt in oil-dependent developing countries. As Jason Bordoff, of Columbia University's Centre on Global Energy Policy, notes, the social stresses now evident in budget-strapped petrostates such as Venezuela and Nigeria are a hint of things to come. Gulf countries would accelerate their efforts to diversify their economies away from oil, as Saudi Arabia is already doing. America might rethink its "oil-for-security" geopolitical bargain with that country. Lower oil revenues could increase instability in places like Iraq.

Oil companies, for their part, will have to explore new lines

of business. The North Sea provides a glimpse of some of the opportunities that lie ahead. Near Aberdeen, firms such as Royal Dutch Shell are decommissioning parts of the spectacular network of rigs and pipelines installed in the 1970s. Andrew McCallum, an adviser to Britain's regulator, the Oil and Gas Authority, says oil companies could deploy their decommissioning skills on projects around the world.

Look to Norway

Statoil, the Norwegian state oil company, has set an example of what oil companies might do in future. Earlier this year it acquired a lease to build the world's largest floating wind farm 15 miles off the coast of Peterhead, north of Aberdeen. Each of its five 6MW turbines will be tethered to the seabed on a floating steel base, enabling it to operate in deeper water than a conventional turbine embedded into the sea floor. That will give it access to stronger winds farther offshore, making it cheaper to produce electricity.

Back in Norway, Statoil also operates two projects to store carbon dioxide under water, in some of the most advanced examples of a technology seen as key to removing greenhouse gases from the atmosphere: carbon capture and storage (CCS). This is costly and still in its infancy, and governments have supported it only erratically. In 2015 a mere 28m tonnes of CO_2 was stored that way. To help meet the 2°C limit, the IEA says the world needs to store a whopping 4bn tonnes a year by 2040.

Biofuels are another way to diversify. At the North Sea port of Rotterdam, Neste, a Finnish refiner, ships in waste fats from the world's slaughterhouses and converts them into biodiesel for the haulage and aviation industry. It costs more than regular diesel, but under EU rules member countries' fuel mix must include 10% biofuels by 2020. Neste's boss, Matti Lievonen, recalls that in 2012 nine-tenths of his company's operating profit came from refining fossil fuels, whereas now renewables account for 40%.

Oil companies, for their part, will have to explore new lines of business

Not all oil companies want to be innovators. Many plan to develop more gas, but also insist that the world's demand for oil as feedstock for petrochemicals will keep them in business even if demand from cars wanes. The IEA predicts that petrochemicals will raise demand for oil by almost 6m b/d in the next 25 years. Oil companies are putting pressure on governments to impose carbon taxes, believing them to be the best way to kill off coal and boost natural gas, at least until renewable energy and batteries have come of age. So far governments have shown remarkably little appetite for such taxes. The IEA calculated that carbon markets covered only 11% of global energy-related emissions in 2014. In contrast, 13% of emissions were linked to fossil-fuel use supported by consumption subsidies.

Transport fuels are more widely taxed, but at vastly different rates, ranging from high in Europe to low in America and China. Experts say that in America it is easier to regulate fuel consumption via vehicle-efficiency standards, which consumers notice much less than fuel taxes.

The crucial, and underappreciated, players in the future of oil are consumers. Their choices, at least as much as those of producers and governments, will determine its ultimate fate, because oil fuels the industries that make goods for them, the trucks that deliver those goods, the cars they drive and the plastic objects that clutter their homes.

This special report started by recalling how the horse was displaced by the car. Urban planners failed to find ways to reduce the horse-manure problem. Governments paved roads, put up traffic signs and introduced legislation that allowed the motor car to establish itself. Yet it was the allure of the Model T for millions of consumers that finally drove the horse off the road.

Similarly, oil companies may turn their attention to alternative fuels, governments may tinker with fuel taxes and congestion charges, battery costs may come down with a bump and the electricity grid may be converted to run on sun and wind. But none of these developments alone will end the oil era. Only when entrepreneurs can capture the public's imagination with new vehicles that transform the whole travel experience, rather than just change the fuel, will the petrol engine run out of road.

This could happen with electric self-driving cars, which may eventually become not just four-wheeled travel pods but mobile offices, hotels and entertainment centres, running noiselessly through city streets day and night. Or it could be some other futuristic innovation. A new play in London, "Oil", predicts that the hydrocarbon age will end with the Chinese mining helium-3 on the Moon to fuel nuclear-powered cars and homes on Earth. Whatever your particular fantasy, there are bound to be more oil wars and oil shocks. But it will be when the internal-combustion engine eventually loses its remarkable grip on the world's roads that the age of oil will come to a screeching halt. ■

Also in this section

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Angela Merkel declares

Not running for world saviour

BERLIN

Germany's chancellor for 11 years just wants to protect her legacy

THE politician most thrilled by Angela Merkel's announcement on November 20th that she will run for a fourth term as German chancellor next autumn was Frauke Petry. The leader of the populist, anti-immigrant Alternative for Germany (AfD) termed it the ultimate campaign gift: the chance to run against the very chancellor who caused the "migrant chaos".

In fact, Mrs Merkel remains the odds-on favourite. Her support sagged during last autumn's refugee crisis but has recovered to 55%, up from 42% in August. Recent polls suggest that the only plausible coalition against her—a left-wing combination of the Social Democrats, the Greens and the ex-communist Left party—will not win a majority (see chart). Mrs Merkel, who took office in 2005, will probably stay through 2021, overtaking Helmut Kohl to become the longest-serving German chancellor (not counting Otto von Bismarck).

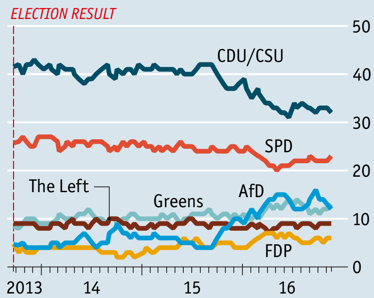
Before she became chancellor, Mrs Merkel told a photographer that she wanted to make a timely exit from politics, to avoid becoming "a half-dead wreck" in office. Now she has decided she must run again. Lacking an obvious conservative successor, she may be the only one able to protect her legacy of centrist politics at a time of populist insurgencies.

The election of Donald Trump as America's next president may have made up her mind. America's role as guarantor of the liberal post-war order is in doubt, and some see Mrs Merkel as the last leader of stature to defend the West's values against the likes of Russia's president, Vladimir Putin, and Turkey's Recep Tayyip Erdogan. As though endorsing these hopes, Barack Obama, visiting Berlin two days before Mrs Merkel's announcement, said that if he had a vote, he would cast it for her.

The chancellor calls such perceptions "grotesque and almost absurd". She is said to view exaggerated expectations as dangerous for her campaign. The AfD, polling at 13%, is still less popular than its counterparts in France or the Netherlands. But the mantle of defender of cosmopolitan globalism would make Mrs Merkel even more of a "lightning rod and provocation" for populists, says one insider.

Still in first

German political party support, % polled



Source: Infratest dimap/ARD

So her campaign will emphasise domestic issues: security, a harder line on cultural symbols (perhaps opposing the wearing of full-face veils) and tougher rules for migrants. On the economic front, she will promise tax cuts and more investment in digitalisation. She will also exploit ambivalence in the only party that could seize the chancellery from her: the Social Democrats (SPD), who have not yet decided on a candidate. Sigmar Gabriel, the SPD's boss, has laid down a timetable according to which the party will first agree on its programme and then sort out "personnel" in late January. He is the default candidate, but less popular than Mrs Merkel, and his announcement last week that his wife is pregnant was taken as a sign that he may not run.

Another Social Democrat, Martin Schulz, does slightly better. He is currently president of the European Parliament. But he plans to step down next year and run for the Bundestag. He might move to Berlin as early as February, to become foreign minister when Frank-Walter Steinmeier, who now runs that ministry, takes the presidency, a largely ceremonial office. From there Mr Schulz could launch his run against Mrs Merkel. Another potential candidate, Olaf Scholz, the mayor of Hamburg, is also waiting in the wings.

Among those hoping that the Social Democrats pick Mr Schulz is, of course, Mrs Petry. "Like no other German," she says, Mr Schulz "stands for the failure of the EU." Together, she adds, Mrs Merkel and Mr Schulz "embody the decline of Germany." Consider the campaign launched. ■

German memes

Lügenpresse, a history

BERLIN

A pernicious term is spreading again

GERMANS are usually proud of their exports, including their words. What better term than *Fahrvergnügen* ("driving pleasure") to sell cars? They are less pleased when foreigners import words that hark back to Germany's darkest chapter. It was therefore horrifying to see white nationalists at a rally in Washington, shortly after Donald Trump's victory, saluting with outstretched arms and shouting "Hail victory!"—a conscious echo of the Nazi greeting, *Sieg Heil!* It has also been disconcerting to hear Mr Trump's supporters adopt the term *Lügenpresse* to refer to the mainstream media, or to any journalists who criticise the president-elect. For in America as in Germany, the term, which means "lying press", is used not only as a cudgel against allegedly out-of-touch media elites but also to validate whatever conspiracy theory the shouter espouses.

Lügenpresse has a long and ugly history in Germany. It was first used after the failed revolutions of 1848, mainly in Catholic polemics against the liberal press. From the start it implied that the media were controlled by Freemasons or Jews. After the Franco-Prussian war, the term was directed at the French press for its alleged lies. During the first world war, after Germany got a thrashing in foreign newspapers for what they called the "rape of Belgium", Allied (and especially British) newspapers earned the moniker. That set a usage pattern that holds till today: *Lügenpresse* refers to any medium that does not reflect the user's own worldview, and must therefore be propagated by a hated "Other".

In the interwar years the term was used both by communists against the "bourgeois *Lügenpresse*" and by the Nazis against—no surprise—the allegedly Jewish and Bolshevik media. Once the Nazis seized power and took control of the domestic press, they naturally stopped calling it a *Lügenpresse*. Instead Hitler and Goebbels once again applied it to the foreign press—for instance, for reporting the 1938 Kristallnacht.

After 1945 West Germans wisely shunned the word. The East Germans were less inhibited: it was now the West German media that became the capitalist and fascist *Lügenpresse*. In the reunited Germany the term made a comeback among neo-Nazi and right-wing groups. Since 2014 it has been a favourite chant at demonstrations by PEGIDA, a xenophobic movement that is centred on the eastern city of Dresden. Some mobs have become physically aggressive against journalists—39 such attacks were counted last year.

In 2014 a jury that chooses the worst German word of the year picked *Lügenpresse*, calling it "especially perfidious". And yet a poll in 2015 found that 39% of Germans, and 44% of eastern Germans, found the word at least partly appropriate. This is dispiriting to critics of the Western media who do not ascribe its failings to malign conspiracies. *Lügenpresse* is one German export that the world would be better off without.

A message strangely popular with Americans, too

France's Republican primary

Dark horse

PARIS

A surging François Fillon ends Nicolas Sarkozy's presidential hopes

HE WAS mocked by advisers to his former boss, ex-president Nicolas Sarkozy, as "Mister Nobody". A month before the vote, he languished in fourth place in the polls. But François Fillon, a former prime minister and amateur racing driver, surged from nowhere to take a stunning lead in the French centre-right Republican primary on November 20th. He took 44% of the vote, next to 29% for the other qualifier and fellow ex-prime minister, Alain Juppé. Mr Fillon is now favoured to win the run-off on November 27th, and possibly become French president next spring.

Mr Fillon's remarkable last-minute acceleration, which led to the eviction of Mr Sarkozy, was partly thanks to a convincing performance in the primary debates. He came across as measured, sharp and trustworthy—and, at the age of 62, a younger alternative to the disliked Mr Sarkozy than the 71-year-old Mr Juppé. The scale of Mr Fillon's lead was not captured by polls, in part because many of the 4m voters made up their minds late: fully 53% of his supporters said they decided in the final days.

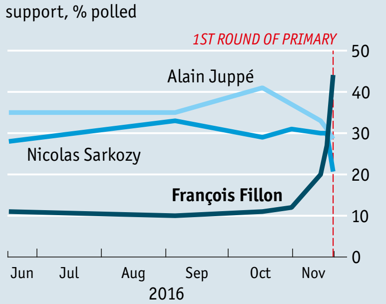
French centre-right voters now have a choice between two candidates who broadly share a liberalising economic agenda, which breaks with the more statist centre-right programmes of the past. Each promises to back businesses and revive the economy by shrinking the state, cutting taxes (and abolishing the wealth tax) and increasing the retirement age.

Yet they differ quite radically on how to do this. Mr Juppé wants to adjust existing rules: a slightly higher retirement age, a slightly lower level of public spending. Mr Fillon is more ambitious and, by his own admission, Thatcherite. He promises that he will curb the power of the unions and end the 35-hour working week rule to allow companies to negotiate working time within European legal limits. He vows to shrink France's unique labour code from over 3,000 pages to just 150. The left caricatures this as "*ultra-libéral*", the ultimate French political insult.

The pair diverge over foreign policy too. A former foreign minister, Mr Juppé sticks more closely to the existing French line of talking tough with Russia and refusing any dialogue with Syria's Bashar al-Assad. Mr Fillon, who is chums with Vladimir Putin, urges a rapprochement with Russia and a strategic alliance with Syria in order to defeat Islamic State. He also sounds readier to work with Donald Trump, America's president-elect. "It wasn't Mr Trump who installed…missiles on the frontier with Russia," declared Mr Fillon during one debate.

A final distinction is on social policy. Mr Fillon, the son of a provincial notary and a practising Catholic with five children, appeals to conservative traditionalists. He voted against legalising gay marriage in 2013, and personally opposes abortion (though he respects existing law). He sounds a tough note on "Islamic totalitarianism", and promises to deport illegal immigrants. This appeals, says a Republican deputy, to "voters we have lost to the National Front". Mr Fillon secured 43% of the first-round primary voters who had backed the FN's Marine Le Pen at the presidential election of 2012.

Mr Juppé's more liberal approach to family policy and identity issues appeal more to the centre and the left, which made up 9%-15% of first-round voters. They could still turn out to block Mr Fillon. But it would require a massive mobilisation now to defeat him. When he appeared on the French version of "Top Gear", a car show, Mr Fillon showed an uncommonly steady hand at the final bend. ■



Last-minute sprint

France, Republican presidential candidates' support, % polled

Sources: Ifop; resultats.primaire2016.org

The Baltic states and Donald Trump

Edgy allies

TALLINN

Estonians count on NATO, but are preparing for the worst

THE morning after celebrating her husband's birthday earlier this month, Barbel Salumae rose at 6am, donned fatigues, and made for a compound outside Tallinn to practice her marksmanship. "I tell my children it's my hobby," says Ms Salumae, a member of Estonia's volunteer Kaitseliit, or Defence League (EDL). "I can't tell them I have to train because maybe there is war coming."

Such talk once struck many outside the three ex-Soviet Baltic states as hyperbolic. Then came Russia's annexation of Crimea in 2014. Now, with American president-elect Donald Trump having questioned commitments to longtime allies, Estonia, Latvia and Lithuania have new reasons to worry. Issues that seemed settled after their ascension to NATO in 2004 have been reopened. "It's living proof that history never ends," says Juri Luik, a former Estonian foreign and defence minister. "We have to explain who we are all over again."

The Baltic states, with their bitter memories of Soviet occupation, have much to lose if America's stance in Europe shifts. During the campaign Mr Trump called NATO "obsolete". Newt Gingrich, a campaign surrogate, dismissed Estonia as "a suburb of St Petersburg". Yet the president-elect's true views are a mystery: after his victory, Mr Trump "underlined NATO's enduring importance" on a call with its secretary-general. Barack Obama has assured allies that Mr Trump will respect America's defence commitments.

Estonians take solace in the guarantees of institutions, which they see as stronger than any one leader. NATO's decision to station 4,000 troops in the Baltic states and Poland from next May has done much to calm nerves. Mr Trump's demand that allies pay their share is welcomed in Tallinn: Estonia, whose soldiers served in Afghanistan and Iraq, is one of only five NATO members that meet the alliance's defence-budget target of 2% of GDP. (Lithuania and Latvia plan to by 2018.) "We need to make sure that Trump and his administration know that Estonia has been an ally," says Lt General Riho Terras, head of the Estonian Defence Forces.

However friendly Mr Trump's disposition towards Vladimir Putin may be, Estonian officials doubt that they can cut a deal. Early in his first term, George W Bush declared that he had got "a sense of [Putin's] soul"; his second term ended with Russia's invasion of Georgia. Barack Obama came to office pledging a "reset" with Russia, yet he leaves with relations at a post-cold war nadir. With Mr Trump, too, reality will constrain policy. "It's hard for me to see what Russia could offer the US," says one senior Estonian official.

Estonia will enter the Trump era with new leadership of its own. A coalition government collapsed on November 9th. The long-dominant Reform Party will give way to the Centre Party, a bastion of Estonia's Russian-speaking electorate, many of whom want closer ties with Russia. The Centre Party's ascension became possible only after jettisoning its controversial leader Edgar Savisaar, who had signed a co-operation agreement with Mr Putin's party. Juri Ratas, the Centre Party's new head, pledges that Estonia's foreign policy will not change. The first plank of the new coalition agreement promises to maintain sanctions against Russia and keep defence spending above the 2% threshold.

In any case, Estonians are leaving little to chance. The citizen soldiers in the EDL will carry on preparing for armed resistance. Enrollment has risen to over 24,500. "The best victory is a victory without a battle," says its head, Brigadier-General Meelis Kiilis. "But the best defence is a well-prepared citizenry." ■

Clarification: In "Rigging the Bids" (November 19th), we reported that Britain's Nuclear Decommissioning Authority (NDA) "was found to have fudged numbers and shredded vital documents to block an American contractor from winning a £7bn ($8.5bn) tender." In fact, the High Court found that the NDA's fudge involved "manipulating" the evaluation of the tender to ensure that one of the bidders, Cavendish Fluor Partnership (CFP), was not disqualified. Separately, the judge criticised the award of the tender to CFP despite a more "economically advantageous" bid by Reactor Site Solutions, a rival consortium. Though he found no proof that documents had been shredded, the judge said the NDA had at one stage intended to destroy bid evaluators' notes. He criticised the NDA's restrictions on note-taking as "verging on the extraordinary". The NDA is appealing against the ruling.

Charlemagne | Running scared

Even without winning elections, populists are setting Europe's pace

WHERE next? After the one-two punch of Brexit and Trump, Europeans are watching every coming election, from Austria to the Netherlands to France, for fear it could become the next staging post in the long march to illiberalism. Europe's centrists have begun to see themselves as modern-day defenders of the Alamo, desperately standing their ground as marauding populists advance on all sides. The siege of the Alamo ended when the Mexican army overran the fortress, slaughtering the doughty Texans inside. Today's equivalent might be the elevation of Marine Le Pen, leader of France's far-right National Front, to the Élysée in next year's presidential election. Victory for Ms Le Pen, it is widely assumed, would herald a new age of anti-European nationalism. Quite possibly it could mean the disintegration of the European Union itself.

Perhaps. But Ms Le Pen has amply demonstrated that she does not need electoral victory to bend French politics to her will. Indeed, the lesson from elsewhere in Europe is that the responsibilities of power can be poisonous for populists: support for the nationalist Finns Party has halved since it joined a coalition in Finland last year. They do better carping from the sidelines, tugging policy in their direction while reserving the right to lob political bombs when necessary. From trade to migration to budgets, Europe's populists are already shaping policy to a degree that belies their limited success at the ballot box. Few may have yet penetrated the fortress keep. But they are hurling infected missiles over the walls, and the liberals inside are already succumbing to the virus.

Take trade. For years European governments have fought among themselves over whether to raise tariffs on state-subsidised exports, such as Chinese steel. But the populist assault on globalisation has lent the discussion fresh urgency. In October Jean-Claude Juncker, president of the European Commission, said that the EU needed better trade defence instruments to take on "stupid populists", and the issue is now *Chefsache*—so important that it must be negotiated among European leaders rather than their (often better-informed) ministers. Anti-trade agitators on the left, meanwhile, have forced governments advocating agreements with America and Canada on to the back foot. Officials now argue that left untackled, Chinese dumping will kill the public consent needed to strike trade deals.

On migration, too, populist pressure has transformed a debate over how to manage refugee movements into an almost exclusive focus on keeping people away. And although for now the attention is on migrants from outside Europe, populists will readily exploit French fears of Polish plumbers, or German angst over Romanian welfare tourists, should it prove expedient. To stave off such anxiety, the EU will probably soon oblige firms employing workers temporarily posted from elsewhere in Europe to match local pay and conditions. The commission, backed strongly by France, says the measure is needed to tackle what it calls "social dumping"; eastern European governments consider this a scandalous breach of single-market rules.

But the populist effect also shows up in what politicians choose not to do, notes Heather Grabbe, director of the Open Society European Policy Institute, a think-tank. Glancing fearfully over their shoulders at the populist menace, governments shy away from controversial decisions, or hedge their support for treaty commitments like helping refugees. The European Central Bank has warned that populism will curb governments' enthusiasm for the fiscal and structural reforms needed to inject a bit of life into flagging economies (and to reduce the euro zone's dependence on cheap money). Recent trade rows will give most leaders pause before declaring themselves in favour of the next deal.

The populist threat also provides governments with a handy "*Après nous, le déluge*" excuse in their disputes with each other, or with Brussels. Both France and Italy have successfully pleaded for fiscal forbearance before the commission, which monitors the euro zone's dreaded budget-deficit limit of 3% of GDP, to see off their domestic political insurgencies. ("I prefer to have a France with [a deficit of] 4.4% today than a France with Marine Le Pen tomorrow," Matteo Renzi, Italy's prime minister, once said.) The best explanation for the tough line the remaining 27 members will take in the coming Brexit negotiations is their fear that a good deal for Britain would leave their own Eurosceptics clamouring for so many carve-outs and exemptions that the EU would be left a hollow shell.

Remember the Berlaymont

The populist nudge need not always be dangerous. Mr Juncker may have a case that the EU needs to revisit its trade-defence policy; America allows itself to impose far higher tariffs on Chinese steel imports than Europe does. On migration, experts had long highlighted the dangers of eliminating most border checks inside the EU before strengthening its external frontiers. If it took a crisis to expose the folly—well, better late than never.

The trouble is that in all these cases governments have lost control of the argument and ceded political ground to parties whose appeal they do not understand. Allowing populists to make the running while deploring their views presents voters with a confusing proposition. Observing the erection of trade barriers or border fences, some may wonder why they should fear the outfits that proposed such ideas in the first place.

Europe has known little but crisis for years, and crises rarely make for smart policy. But when Europe's fearful mood lifts, its leaders will need to find the courage to manage the populist threat rather than to be led by it. The Alamo may have ended in disaster, but the Texans regrouped and eventually battled their way to victory. Perhaps in time Europe's beleaguered liberals can find the courage to do the same. ■

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The Autumn Statement

The Brexit budget

Philip Hammond delivered a small-bore budget for a post-referendum Britain

THIS year's Autumn Statement, the first big event on the fiscal calendar since the EU referendum in June, was always going to be a strange exercise. Britain is in a state of unprecedented uncertainty. The government is unclear about what sort of Brexit it wants. Economic forecasting is, as a result, as good as guesswork. The outlook for the public finances is similarly uncertain. Still, as he rose to deliver his statement in the House of Commons on November 23rd, Philip Hammond, the newish chancellor, had to achieve two big objectives.

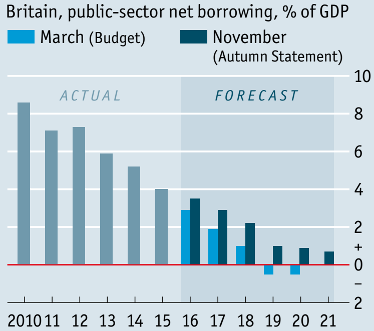
First, he had to show willingness to help the economy were it to be blown off course by Brexit, all the while keeping the public finances on an even keel. Second, he had to live up to the rhetoric of Theresa May, the prime minister, who has repeatedly promised to help so-called "just-about-managing" families (JAMS), a vaguely defined bunch of 6m or so working-age households on low-to-medium incomes.

Mr Hammond's task is made harder by Brexit. The Office for Budget Responsibility (OBR), the fiscal watchdog, thinks that by 2020 the economy will have grown by 2.4 percentage points less than it predicted before the referendum. As a consequence, over the next five years the government is expected to borrow £122bn ($152bn) more. But the OBR did not model what Brexit could actually look like. And the risks to the economy—leaving the EU's single market, say—are clearly to the downside, as the OBR's documentation appears to show.

With this in mind, Mr Hammond chose to keep things simple. The Autumn Statement contained just 18 new tax measures, roughly half the number that his meddlesome predecessor, George Osborne, was accustomed to making. The unflashy Mr Hammond kept the gimmickry to a minimum, relenting only to bung £7.6m towards the restoration of a stately home that he said had inspired the country estate of Pemberley in "Pride and Prejudice" (the small community of people who follow both Jane Austen and British fiscal policy immediately pointed out that Chatsworth House, 30 miles south, has a better claim).

Knocked off course

Britain, public-sector net borrowing, % of GDP



Source: OBR

Mr Hammond's main objective, though, is to be able to respond to whatever Brexit throws at him. Out went Mr Osborne's ambitious target to reach a budget surplus by 2019-20 (see chart). Mr Hammond committed himself to three fiscal rules, but they are hardly savage. A cap on overall welfare spending will not come into force until 2021, when the worst of the Brexit-related uncertainty is over. He wants public-sector debt, relative to GDP, to be falling from 2020.

His third rule is to reduce overall government borrowing, adjusted for the economic cycle, to below 2% of GDP by 2020-21. In effect this allows Mr Hammond to borrow more to cover higher welfare spending and lower tax receipts, which would result if the economy slows. The OBR reckons that by this measure, the deficit will be 0.8% of GDP in 2020.

This approach thus gives him some fiscal room to offset a Brexit-related slowdown. Mr Hammond has put an extra £23bn towards infrastructure, including projects such as new railway signalling and upgraded "digital infrastructure", including internet connections. In 2019-20 public-sector net investment, as a percentage of GDP, will be 0.4 points higher than was planned in March. This may not make much difference, however. The OBR, indeed, has revised down its expectations for productivity growth.

And despite the extra money for infrastructure, overall the government's spending plans will drag on growth in the coming years. Under Mr Osborne, policy called for a reduction in the budget deficit, adjusted for the economic cycle, of 0.8% of GDP in 2017-18. That is big by historical standards, and would be a tight squeeze even on a strong economy. Yet Mr Hammond did not loosen it. In 2019-20 an adjustment ▸▸

of 1.1% of GDP is called for, the biggest contraction since 2011-12. With an election soon after, only the bravest chancellor would follow through with such a plan.

A raspberry for the JAMs

Within the constraints of a poor fiscal outlook, this Autumn Statement was billed as being about the JAMs. Things got off to a slow start: in his speech to MPs, Mr Hammond did not once mention that ugly acronym. Still, he made much of bumping up the minimum wage for the over-25s, from £7.20 to £7.50 per hour. Proposed curbs on estate agents' fees for renters are another headline-grabbing measure for this constituency (see box). He also reduced the "taper rate" on universal credit (a big working-age benefit, to be rolled out fully by 2022), meaning that as people earn more, their benefits are withdrawn at a slower rate.

These changes are modest, however. The reduction in the taper rate is small, ultimately costing the Treasury just £700m a year. The government is still cutting other parts of universal credit by more than £3bn, points out Alfie Stirling of IPPR, a think-tank. Nearly all of the rise in the minimum wage will be taken away again from the lowest earners. The thrust of welfare policy remains extremely regressive. A cash-terms freeze on working-age benefits is in place until 2020. With inflation rising, partly due to the weaker pound, the real value of benefit payments is eroding fast.

Mr Hammond focused much of his attention not on the JAMs, but the better off. A year-long freeze on fuel duty, at a cost of about £900m a year, predominantly helps richer people, who drive more. He is honouring the pledge of the previous government to raise the threshold of the higher rate of income tax to £50,000 by 2020. Even lifting the threshold of the basic rate, another promise, is not as progressive as it sounds: roughly 40% of adults don't pay income tax at all.

More than anything, though, the JAMs will lose out from Britain's deteriorating economic outlook. The Resolution Foundation, a think-tank, reckons that relative to the March forecast, average real earnings will be £830 a year lower in 2020. This year's Autumn Statement, in sum, hinted at how painful Brexit is going to be. ■

Letting agencies

Rent extraction

Plans to ban agencies from hitting their tenants with fees have some merit

PHILIP HAMMOND pulled no rabbits from his fiscal hat when he delivered his Autumn Statement on November 23rd. But he did offer up a carrot, when he recycled an old Labour proposal to ban the fees that property-letting agents can charge tenants.

Such fees are often steep and hard to justify. Liz, a renter in London, describes forking out £400 ($500) in fees when she moved into her flat. It was supposedly to cover drafting the contract. But the document was hardly bespoke: one clause referred to a garden, which her flat doesn't have. According to Generation Rent, a pressure group, average agency fees are £386 for a two-person household. It cites some of the vast menu of charges faced by renters: £113 to renew a tenancy, £360 to add a tenant, £26 for overpayment of rent and £75 for a "pet licence".

Administration costs money, the agencies argue. Fees discourage tenants from pestering agencies or making unnecessary changes to their contracts. David Cox, head of the Association of Residential Letting Agents, called the announcement "draconian". "If fees are banned, these costs will be passed on to landlords, who will need to recoup the costs elsewhere, inevitably through higher rents," he said.

That might be better than the current arrangement. Agencies compete for the custom of landlords, not tenants. Once flathunters find their dream home, they are stuck with whichever agency the landlord has picked. And the landlord is unlikely to think much about the fees charged to tenants when choosing an agency. Furthermore, as long as letting agencies can charge high fees at either end of a contract, their incentive to foster long, stable relationships between landlords and renters is weak. And higher but more predictable expenses could be easier for tenants to manage. Liz says it would feel fairer: "Like part of the deal rather than a bolt-on extra."

Who will foot the bill? In Scotland, where the government implemented such a ban in November 2012, a survey by the Scottish Association of Landlords and the Council of Letting Agents of their members found that a third of agents started charging fees to landlords rather than tenants. A fifth reported that rents had increased. A report by Shelter, a homelessness charity, found that rents rose no more quickly than in other parts of the country.

Both landlords and tenants hope that letting agencies will absorb the cost of the policy themselves. Investors appear to think there will be at least a bit of this. Between 4.30pm on the day before Mr Hammond delivered his blow and 24 hours later, shares in Foxtons, a large lettings agency, plunged by 14.4%. Many of its tenants will feel little sympathy.

Slumdog v millionaire

Brexit from abroad

The views of others

BERLIN

The rest of Europe is preparing to take a hard line in Brexit negotiations

THE debate over how to leave the European Union has been notably inward-looking: whether to go for hard or soft Brexit, when to start the Article 50 process that is the legal route to departure, how far Parliament should be involved. Yet all these pale into insignificance against the biggest issue of all: what sort of deal can Britain extract from its 27 EU partners?

Brexiteers like to say that Theresa May merely has to agree something with Germany's Angela Merkel, who listens to carmakers that sell heavily to Britain. They claim a big trade deficit makes Europe more dependent on Britain than the other way round. They reckon that, since everyone gains from free trade, it will be simple to negotiate full access to the single market. They suggest Britain's outsized contribution to defence and security should win the country concessions. And since the voters have spoken, the others must just accept that Britain will take back control of its borders, laws and money.

Would that things were so easy. In Berlin, officials point out that Brexit does not even feature high on Mrs Merkel's agenda. Her first priority is to preserve the EU of 27, which is in a parlous condition. That points above all to ensuring that Britain is in a worse position post-Brexit than as a member. Nor can she deliver the agreement of other EU countries, many of which export little to Britain. German industry has already accepted that, when it comes to Brexit, politics takes priority over firms' desire to maintain British sales.

The Germans reject any idea of security as a bargaining chip. As for accepting British voters' wishes and conceding barrier-free access to the single market, the 27 other leaders retort that they have voters too. Indeed, Mrs Merkel and her colleagues are maintaining a united front. Until Mrs May triggers Article 50, which sets a two-year deadline for Brexit, there can be no negotiations. When they start, the EU will be clear that being in the single market means accepting the four freedoms of movement of goods, services, capital and people. These are "indivisible": if Britain rejects the fourth, it cannot keep its privileged access.

Europeans' reading of British politics reinforces their tough approach. Charles Grant of the Centre for European Reform, a think-tank, says Brussels officials are dismayed by the apparent influence of right-wing Eurosceptics on Mrs May. The EU has also long hated Britain's pick 'n' mix approach. One German official says flatly that there can be no cherry-picking and opting in or out: otherwise why should Germany not choose to opt out of its huge payments to the EU budget? The German finance minister insists that Britain will go on paying for many years, and in Brussels there is talk of an exit bill for Britain as big as €60bn ($63bn).

Forging new trade relations will also be difficult. These days free-trade deals take years to negotiate and ratify in national parliaments. That timing is bad for Britain. In Brussels, officials say the two-year timetable means that an initial Article 50 deal must be wrapped up by the summer of 2018. Hence the business interest in an interim plan to avoid falling off a cliff in early 2019 without future trade terms being concluded. Mrs May nodded to this concern at this week's conference of the Confederation of British Industry (CBI). Yet interim deals can be as hard to do as final ones.

The broader ills of the EU and, especially, the euro, could also play badly for Mrs May. Some Brexiteers point gleefully to the rise of Eurosceptics like Marine Le Pen in France and Geert Wilders in the Netherlands, the troubles of Matteo Renzi in Italy and even Mrs Merkel's loss of support at home. Yet as Mujtaba Rahman of the Eurasia Group, a consultancy, points out, if the 27 perceive an existential threat to their project, that will push them to be harder, not softer, on Britain.

Of course it is not surprising that, in advance, both sides should take up hardline positions. And Brexiteers are right that everybody has an interest in some free-trade deal. At the CBI conference Mrs May talked of give and take in any negotiation, pointing to room for compromise. Germany and others have been imposing rules to limit welfare benefits paid to migrants; some countries support an emergency brake against sudden surges in numbers. That Mrs May has not explicitly ruled out paying into the EU budget could help.

What is needed most in the months ahead is deft diplomacy. And here the Brexiteers are not doing well. Boris Johnson, the foreign secretary, has offended Italy by hinting that it relies on prosecco exports to Britain, and everybody else by calling the link between the single market and free movement of people "bollocks". David Davis, the Brexit secretary, did not impress on his visit to the EU institutions this week. To get a better deal, Mrs May will have to work harder to improve relations with her European colleagues. ■

Tech companies

Put out more deck chairs

Silicon giants cautiously commit to Brexit-bound Britain

THE future does, after all, belong to barista stations, sun loungers and nap pods. Since the vote to leave the EU on June 23rd there have been fears that London's position as Europe's tech capital is under threat. But recent announcements by America's biggest tech companies have offered some reassurance—as has, oddly, the election of Donald Trump.

Apple kicked off on September 26th, confirming that it would consolidate eight sites in Britain into one new office in the redeveloped Battersea Power Station in south-west London (pictured). About 1,400 existing employees will move there; the half-million square feet of space could eventually absorb twice that number. On November 15th Google confirmed plans to build sprawling new headquarters alongside King's Cross station and said it would create 3,000 new jobs in Britain by 2020. The next week Facebook announced that it would enlarge its British workforce by half, to 1,500, when it opens its new London office next year. Then IBM said it would unveil four new data centres in Britain, tripling its capacity for cloud services in the country and creating "hundreds" of jobs.

These plans had been in the pipeline before the referendum, but were thrown into doubt by its result. Tech is one of Britain's best-performing industries, having grown 32% faster than the wider economy from 2010 to 2014. But it is vulnerable to Brexit as it employs a lot of foreign workers, many from continental Europe. By one estimate a third of techies were born overseas, so any restrictions on the free movement of labour could hit the sector hard. Investments were put on hold following the referendum; some firms began looking towards Berlin and Paris.

But most seem to have concluded that the advantages of staying in London outweigh the uncertainties of Brexit, at least for now. Google says the size of Britain's domestic online market, the talent in the capital and the country's "openness and connectedness" were good reasons to stick with its expansion plans. It still has "concerns" about the free movement of the highly prized software engineers and designers that it needs, and will be monitoring this closely. Apple says much the same.

"Everyone is assuming that immigration is going to get sorted one way or another," says Hussein Kanji, head of Hoxton Ventures, a tech venture-capital firm. Ministers and officials have been giving reassuring messages that the flow of well qualified, high-earning geeks will not be unduly restricted. Britain currently gives out 200 visas a year to non-EU tech workers under the "Exceptional Talent" scheme. This November has seen a record number of applications. It is a complex and expensive process, often costing upwards of £1,600 ($2,000) per person, and so easier for giants like Google and Facebook to negotiate than for startups. Some expect the scheme to expand; Gerard Grech, the head of Tech City, which operates the visa scheme together with the Home Office, says only that he is in "ongoing conversations" with the government on the matter.

Matt Clifford of Entrepreneur First, the country's largest tech incubator, argues that Mr Trump's presidency could make a difference, too. Just as Brexiteers' anti-immigration arguments spooked London's techies, so Mr Trump's rhetoric on immigration worries Silicon Valley. If Britain loses some post-Brexit business to Berlin and Paris, it might at least pick up a few refugees from California. ■

Bagehot | Spreadsheet Phil, unlikely rebel

A naturally unpolitical chancellor of the exchequer must discover his political side

PHILIP HAMMOND was elected to his Surrey seat in 1997 on, among other things, a pledge to bring back hanging. In his first speech to the Commons—usually a chance for new members to linger on their constituency's history and character—the pinstriped MP for Runnymede and Weybridge made a few perfunctory remarks about the number of golf courses he represented before plunging into a lecture about aggregate supplementary credit approvals and cash-backed set-aside capital receipts. Later, as a quietly efficient transport secretary, defence secretary and foreign secretary under David Cameron, he voiced scepticism about gay marriage and in 2013 claimed that, given the chance, he would vote to leave the EU. When, as Britain's top diplomat, he backed Remain in June, it was without much brio. Thus he acquired a reputation for being a fiscally hawkish, ideological right-winger: Spreadsheet Phil. "I believe he last told a joke in about 1978," said a Westminster colleague when Theresa May made him her chancellor of the exchequer in July.

It is thus curious that Mr Hammond has since emerged as a hero of the Tory left: a champion of a liberal, open Britain and looser public finances. In his speech to the Conservative conference last month he made waves by stressing the risks and costs of leaving the EU: "The British people did not vote on June 23rd to become poorer." He further incensed Brexiteers when he suggested, *pace* the prime minister, that foreign students be removed from immigration quotas. All of which was crystallised in the Autumn Statement on November 23rd, when Mr Hammond ditched fiscal rules established by George Osborne, his predecessor, and spoke of the "uncertainty" and "slower growth" caused by Brexit. He further defied his reputation by cracking jokes that were (by the subterranean standards of such occasions) not bad: ribbing Boris Johnson for his failure to nab the premiership, for example.

So is Britain's new chancellor a bone-dry Thatcherite or a Europhile centrist? For the answer (neither) it helps to look at his background. Before 1997 Mr Hammond was not a banker or an accountant, but a scruffy entrepreneur. Growing up in semi-detached normality in Essex, he made money by staging discos for schoolmates. He graduated to trading cars, then to selling medical instruments, then to building houses. He made a small fortune in the process of all this hustling, risk-taking, succeeding, failing and starting over. From this experience comes his essential trait: a tight, pragmatic focus on the job before him at a given moment. He is less Colonel Blimp than Derek Trotter, the wheeling, dealing, infinitely versatile hero of "Only Fools And Horses", a well-liked sitcom. When it suited Mr Hammond to be a right-wing parliamentary candidate, he played that role. When, as defence secretary, he had to bear down on costs, he did so. Now, as the guardian of the British economy, he militates for growth and jobs over immigration controls.

From Mr Hammond's unpolitical nature flowed the Autumn Statement's essential modesty. In the narrow space granted by worsening fiscal forecasts, he did what he could to substantiate Mrs May's grand talk of remaking globalisation to save it from itself, of helping the grumpy, "just about managing" voters (known in Whitehall as JAMs) who tilted the balance in the Brexit referendum. But it was not very much.

Meanwhile, parts of his speech were pointed criticisms of Mr Osborne, who as chancellor had worked hand-in-glove with Mr Cameron and, in doing so, had used the Treasury to shape the government and the political landscape (his welfare cuts, for example, had been about shrinking Labour's client electorate, as well as getting the public finances under control). "I have deliberately avoided making this statement into a long list of individual projects being supported," Mr Hammond said, as his predecessor, now on the backbenches, hoisted his eyebrows. The chancellor continued: not only would he avoid gimmicks and leave it to ministers to decide what to do with their money, but he would even cut the number of annual "major fiscal events" by creating a single, autumn budget.

All of which is welcome. Yet the depoliticisation of Whitehall's imperial department comes at a strange time. The Treasury is too mighty. Yet now, more than before, there is a defence for such mightiness. Consider the bigger picture. The Brexiteers won the EU referendum without specifying how Brexit should look. Mrs May has centralised decisions but is struggling to take some of them: witness the recently leaked memo by a consultant fretting that "no common strategy has emerged" between departments and the prime minister's cryptic warning against a "cliff edge" on leaving the EU (this apparent argument for an interim deal was soon disowned by Number 10).

Friends reunited

It is not as if Mrs May and Mr Hammond are at odds. Both grew up in middle-class, home-counties families, both studied at Oxford (they met there), both entered Parliament in 1997 as MPs for gin-and-Jag constituencies, both are proudly unflashy, detail-obsessed types. The tensions between them say more about their roles than about their styles or outlook. As chancellor Mr Hammond considers it his job to look after the finances. As prime minister Mrs May, like him a task-oriented sort of leader, considers it hers to enact Brexit to the satisfaction of the JAMs.

The tragedy is that their tasks are more interdependent than they realise. To make Brexit a success Mrs May must bind in Mr Hammond. To do his job he must guide the prime minister and, through his media profile, shape voters' expectations. The government can afford to be a little fragmented. But within a year Brexit talks will be under way and painful trade-offs will loom, demanding a tight May-Hammond nexus. In the long term, Bagehot would like to see a smaller, more modest Treasury. But for now: let it meddle. ■

Climate policy

Up in smoke?

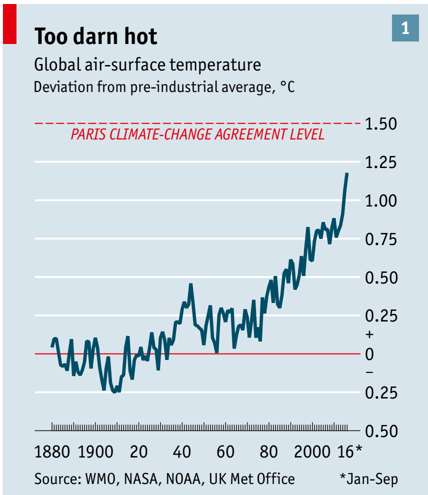
MARRAKESH AND WASHINGTON, DC

As America's president-elect toys with abandoning climate commitments, the rest of the world is working out how to keep on course

"LIKE ice water through the veins." That is how a UN official, in Marrakesh for the UN climate summit that ended on November 18th, described the effect of Donald Trump's electoral victory. Her trepidation was widely shared at the two-week event—and justified. In a tweet in 2012 Mr Trump called anthropogenic warming a "hoax". On the campaign trail he said he would abolish America's Environmental Protection Agency (EPA) and "cancel" the UN agreement to curb greenhouse-gas emissions adopted by 190-odd countries in Paris last year. But in an interview this week with the *New York Times*, he seemed to waver. Gathered in the ancient Berber city, representatives of those countries pondered whether America is about to forfeit the leadership on climate change it belatedly showed when Barack Obama helped bring about the Paris accord.

That deal, which came into force earlier this month, includes a commitment to limit the increase in the global average temperature to "well below" 2°C above pre-industrial levels. Given that the world has already warmed by approximately 1.2°C, this is hugely ambitious (see chart 1). With just a few weeks to go, this year looks likely to be the hottest on record.

Yet the measures the signatories vowed to adopt were comparatively modest. Most were self-proposed and voluntary cuts to their emissions of carbon dioxide, in particular those caused by deforestation and the burning of fossil fuels. Most developing countries, which produce around 65% of global carbon emissions, promised to restrict their emissions to levels that, assuming natural gas continues to substitute for



coal and the cost of renewable energy continues to fall (see special report in this issue), may require no special efforts. India, the world's third-biggest producer of greenhouse gases (see chart 2 on next page), pledged to increase its use of energy from renewable sources. Overall, though, its target is estimated to represent a rise of 90% compared with current emissions.

By the summit's close some of the Trump-fuelled anxiety had eased. That was in part because the talks demonstrated the value and durability of the Paris deal. As well as the overall target, it contains many useful provisions, on climate finance, technology sharing and the role of forests, for example. Over time, these could help countries make faster progress than now seems plausible. Past climate deals failed in part because they tried to impose mitigation targets on reluctant countries, rather than allowing each country to decide for itself what it thinks is achievable. The Paris agreement, by contrast, is sufficiently loose in its structure and modest in its aims to be able to withstand America, the world's second-biggest carbon emitter, abandoning it.

American and other officials in Morocco downplayed that possibility. In a striking reversal of the two countries' recent positions, Liu Zhenmin, China's vice-foreign minister, coaxingly invited America not to shirk its environmental responsibilities; the UN's early climate negotiations, he noted, had been supported by two Republican presidents, Ronald Reagan and George H.W. Bush. John Kerry, America's secretary of state, said that, though he could not second-guess Mr Trump (who had no representative in Marrakesh), he had "learned that some issues look a little bit different when you're actually in office compared to [during a] campaign".

Mr Trump is indeed unpredictable. Since the election he has signalled a contempt for climate science by appointing a climate-change denier, Myron Ebell, to plan his takeover of the EPA, through which Mr Obama, in the absence of congressional support for environmental law-making, has issued much new green regulation. In the *New York Times* interview, however, Mr Trump suggested that he accepted the reality of anthropogenic warming and might not seek to withdraw from the Paris accord. He has now taken just about every position on climate change imaginable. As well as calling it a hoax—by the Chinese, with the aim of harming American manufacturing—he has said the world is warming but humans have nothing to do with it, that human activity plays a "minor" role in warming, donated money to a group lobbying for action to avert climate change and, in 2009, signed a public letter calling for cuts to America's emissions, thereby creating "new energy jobs".

Mr Trump's view on climate change, it seems, is chiefly governed by what he thinks each audience wants to hear. That may be good news for the world. Public concern about global warming is rising in America; 64% of Americans say they are worried "a great deal" or "a fair amount" about it, and 71% say America should not withdraw from the Paris accord—including a majority of Republicans. As for scrapping the EPA, the share of Americans who like the breathable air and drinkable water the agency helps to safeguard is no doubt even higher. Mr Trump acknowledged this, too, in his recent interview: "Clean water, crystal-clean water, is vitally important."

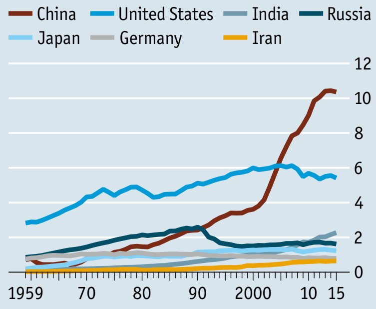
Abolishing the EPA, moreover, would require legislation that Democratic senators, though in the minority, could block. The main subsidies for wind- and solar-power generation, which made up two-thirds of new generating capacity last year, appear similarly beyond Mr Trump's reach. They were extended last year by a Republican-controlled Congress; windy red states such as Kansas, Oklahoma and Texas are among their main beneficiaries.

Mr Trump could try to remove greenhouse gases from the EPA's remit, though this would require the Supreme Court to reverse itself on a ruling from 2007. Or he could rescind environmental regulations brought in by Mr Obama, even if this would often be difficult. Many of these were mandated by legislation and have been tested by litigation, thereby accruing a legal standing of their own. For example, in order to get rid of a rule that curbs the amount of mercury and other toxic emissions from power plants, Mr Trump's EPA boss would have to issue, in effect, a less exacting alternative, then defend it against legal challenges from environmental campaigners. That could take years.

Peak or precipice? 2

Fossil-fuel use, biggest CO_2 emitters in 2015

Tonnes bn



Source: Global Carbon Budget 2016

But other rules are more vulnerable. They include a handful passed as executive orders—for example, one that mandates the energy-efficiency standards of federal agencies—which the new president could strike out. In addition, any regulation issued between Mr Trump's election and his inauguration could be frozen, at least temporarily. Incoming administrations often threaten to revoke such "midnight regulations", but rarely do so, to avoid the bother of having to replace them, as they must. But this could spell the end of Obama measures such as a rule issued on November 15th to control methane leakage from oil and gas operations on federal lands.

Emboldened by the prospect of a unified Republican government, Republican congressmen could get in on the act. Under a rarely used law, the Congressional Review Act, Congress can revoke any rule, with a majority vote, within 60 congressional working-days of its issuance. As Congress has not been terribly active in recent months, it could in theory scrap all regulations issued since mid-May.

Mr Obama's most important environmental regulation is the Clean Power Plan, which seeks to limit carbon emissions from coal- and gas-fired power stations. It is considered crucial to America's chances of fulfilling its commitment under the Paris accord to cut its emissions, by 2025, to 26-28% below their 2005 level. Mr Trump has promised to scrap the plan. It is currently stayed by the Supreme Court while a legal challenge by 27 states and some companies is mulled in the federal appeals court in Washington, DC. If that court rules against it, a Trump administration would not appeal. If it is upheld, its challengers would appeal to the Supreme Court, where the Trump administration might refuse to defend it. If it makes it through the Supreme Court, the Trump EPA could probably rescind and replace it.

But even this would not persuade many electricity companies or states to reverse the shift they are already making towards renewables and away from coal. The growth of renewables has helped cut America's emissions from power generation by around a quarter since 2005. The main reason for that progress, an abundance of cheap shale gas, gives the lie to another piece of Trumpian bluster: the tycoon's promise to pep up the coal industry.

America's shale-gas revolution has made generating electricity from gas almost as cheap as generating it from coal (see chart 3 on next page). Once the costs of probable future environmental regulations are allowed for, new gas-fired power-stations look like better business than new coal-fired ones. This year is expected to be the first in which America generates more electricity from gas than from coal; 94 coal-fired power-stations closed last year and 41 more are expected to shut this year. Mr Trump has promised to make more public land available to miners; but access to coal reserves is not their problem. He probably could not intervene to reverse coal's decline without actively handicapping renewables or natural gas.

All in all, optimists think the environmental damage caused by a one-term Trump administration could be relatively limited. Whether they are right, however, will depend on how much he attempts. Perhaps the biggest risk is that, having already abandoned some more prominent campaign promises—for example to wall off Mexico and deport 11m undocumented migrants—he could view a bonfire of environmental regulation as a relatively low-cost way to placate his disappointed supporters. Slashing funding for "politicised" climate research, as one of his advisers has said is on the cards, might please them, too.

Previous Republican presidents whose sympathies lay with the coal- and oil-men played by the rules, frets an environmental lawyer who fought them; perhaps Mr Trump will not. He could, for example, simply stop implementing environmental rules across the board, and let the legal battles rage. It seems unlikely. But so was his impending presidency.

Easy free-rider

The delegates in Marrakesh were comforted in part by a hope that Mr Trump would soon realise that withdrawing from the Paris deal would weaken his hand in every other international bargain he might wish to make. "If you renege on deals, you don't get the one you want next time," says James Cameron, the chairman of the Overseas Development Institute, a British think-tank. But if that calculation does not hold, progress under the Paris accord may not be as fast as it would otherwise have been.

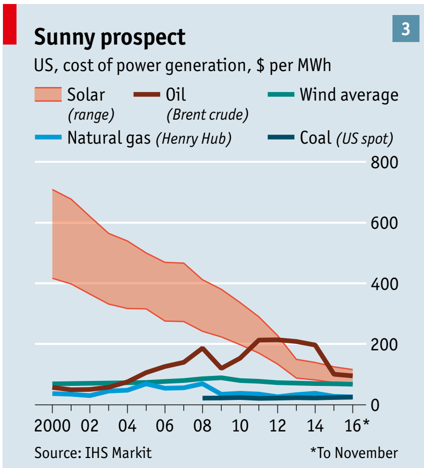
Countries have until 2018 to work out how to tot up the results of their environmental efforts; in 2020 they will set themselves new, hopefully tougher, targets. This process would probably be less robust and more secretive without America's involvement. Developing countries, whose unmet energy needs are still substantial, might find it easier to fudge their figures. And persuading other countries to raise their ambitions in four years' time would be difficult with America standing idly by.

Not just leadership and motivation would be in shorter supply, but also money for green schemes. By 2020, $100bn a year is supposed to be available, most of it for cutting greenhouse-gas emissions and the rest for helping countries to adapt to climate change. Rich countries are supposed to pay almost all of it; the rest of them may balk if America fails to do its bit.

But some think large transfers from rich countries to poor ones are in any case becoming less important to international environmental efforts. Droughts, heatwaves and other extreme events are already more likely because of global warming, and the link between climate change and such disasters is becoming more widely accepted. Negotiations about paying for mitigation and adaptation efforts used to resemble talks between hostage-takers and those trying to free them, says Hal Harvey, an energy consultant: poor countries would demand money from rich ones in return for not exploiting their own ecosystems.

Now these countries are increasingly realising that they need to act to limit global warming for their own sakes, whether or not sweeteners are forthcoming. In Marrakesh 48 of the least-developed ones promised to supply their entire energy needs from renewable sources by 2050. Rachel Kyte, a UN energy official, says that many more are looking for help to set up energy-efficiency schemes and to work out how best to spend what money they have.

Slowing economic growth and falling demand for coal in China mean that it may already have passed the high point of emissions, about 15 years ahead of the date it promised under the Paris deal. By 2020 it plans to have tripled its solar capacity—already greater than that of any other country—to 143 gigawatts (GW); two years ago the world's entire installed solar capacity came to 181GW. If this enables China to burn less coal, it will help tackle air pollution, a huge problem in its cities. According to research published last year, spending a day in Beijing does about the same harm to a person's health as smoking 40 cigarettes.



Sunny prospect
US, cost of power generation, $ per MWh
Source: IHS Markit
*To November

Strenuous efforts by China to cut emissions would also mean vast domestic demand for clean-energy technology, which would help the country's firms to consolidate their lead in supplying a fast-growing, and lucrative, global market. While Mr Trump occupied himself with a few unprofitable coal-mines, China could be taking a commanding lead in batteries, solar panels and wind turbines.

The cost of renewable energy has already come down a great deal in the past couple of years, and with greater economies of scale, will fall further. Even though government subsidies in some places, including Britain, are being chopped, renewable sources are making more commercial sense. In some places offshore wind energy costs just half as much as it did three years ago. And solar installations in the world's sunniest spots now offer power at less than 3 cents per kilowatt-hour (kWh)—cheaper than even the most economical gas plants. "With solar so cheap you might think it is a communist plot, but you're still going to put up the panels," says Mr Harvey. The volatile price of fossil fuels also makes them less attractive when planning new generating capacity.

The dawn of a communist plot

For India, too, cheaper renewable energy will be a boon. Around 300m of its people, mostly in rural areas, have no electricity supply; off-grid solar installations would be life-changing. India has pledged to install 175GW of renewable capacity by 2022, most of it solar. This would mean doubling solar capacity every 18 months or so; it is roughly on track to meet its goal.

According to Arunabha Ghosh of the Council on Energy, Environment and Water, a think-tank in Delhi, India's plans will not be affected if America pulls out of the Paris deal since they are in the country's own interests. Extreme weather events linked to climate change already result in huge distress and enormous bills: in the 12 months to April 2014 central and state governments spent $92bn after floods, droughts and other disasters.

Support for continued climate action has emerged from other surprising quarters. Saudi Arabia recently announced new efficiency schemes for energy and water, which will make it easier to cut huge subsidies to both and thereby put further downward pressure on demand. Indonesia is also cutting subsidies for fossil fuels; until recently these absorbed a bigger share of public spending than either health or education, says Erik Solheim, the head of the UN Environment Programme.

The new climate crusader

Seven years ago, when climate talks in Copenhagen crashed and burned, Chinese intransigence was widely blamed. Its officials have not forgotten the experience. A chance to play the hero and rescue global environmental efforts would be appealing—though China surely wants America to stay involved. American and Chinese leadership has achieved unprecedented levels of international co-operation on climate in the past year. Though the deal struck in Paris was too modest, the hope that countries would increase their efforts over time was realistic.

That hope has been shaken by Mr Trump's election, but not extinguished. The money governments and firms have already pumped into renewables and energy-efficiency programmes mean that progress will continue. Not everywhere will suffer the effects of climate change, from flooded streets and scorched fields to empty reservoirs and burning forests, equally. But even if Mr Trump reneges on America's environmental promises, others will try to stop the worst of them. ■

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The Trump Organisation

Deconstructing Donald

NEW YORK

Both the president-elect and his critics have exaggerated the scale of his firm

THE NEW Trump Tower in Worli, a buzzing district of Mumbai, looks like any building site but its marketing sells a dream. A golden structure soars to the sky alongside a picture of Donald Trump. He is—potential residents are assured—the gold standard around the globe, a dealmaker without peer who operates across the gateway cities of the world and the man who built the American dream. Until a few days ago the developer, Lodha, carried a message on its website: "Congratulations Mr President-elect". But now that a storm has blown up over the possible conflicts of interest between the various operations of Mr Trump's group and his new job, it has been deleted.

The self-embellished legend is of a global tycoon. In a kind of mirror image, outraged suspicion is mounting that the Trump Organisation could morph into a vast global network of cronyism. America has been treated to reports of multi-billion dollar projects across the planet, to photos of Mr Trump glad-handing businessmen and to images of exotic, Trump-branded buildings standing like monuments to the decay of American ethics. Paul Krugman, a left-of-centre economist, has suggested that the Trump family could reap $10bn while its patriarch is in office.

The president-elect's unconventional methods mean it is too early to say if that will even begin to come to pass. But understanding the threat requires a sober view of his firm. Far from being a global branding goliath, it is a small, middle-aged and largely domestic property business. If Trump family members are to make a second fortune in the next four years, they will have to reinvent a mediocre firm. It could even be the weakness rather than the potential of their company that is most likely to motivate Mr Trump to blur the line between politics and business.

Information on the Trump Organisation is mainly limited to Mr Trump's filings with election monitors. *The Economist* has aggregated the financial data of 170-odd entities, which were filed in 2015. For some assets the filings only provide a range of values and revenues, so we have added our own estimates and those of third parties.

Start with size. Trump Inc is worth perhaps $4bn, with $490m of annual revenue. Were it listed it would be the 833rd-largest firm in America by market value and 1,925th by sales. Other occupiers of, and contenders for, high political office—including Nelson Rockefeller, Ross Perot, Mitt Romney and Michael Bloomberg—have owned and run more powerful firms.

About four-fifths of that value sits in residential and commercial properties, including golf courses, owned by the Trump Organisation. Half of the group's entire worth consists of five buildings: Trump Tower and two other Manhattan buildings, and passive stakes in two offices in New York and San Francisco that are controlled by Vornado, a real-estate trust that is entirely separate.

The group's branding operation is puny, generating only 11-13% of its asset value and sales. Its largest individual source of fees is Panama, where there is a Trump-branded hotel. The Mumbai project has paid annual fees of about $550,000 for the Trump brand. Hotels in Toronto and Manila also paid modest sums. It is also a domestic affair: 66% of the Trump Organisation's value is in New York and 93% is in America. Mr Trump created its best assets over a decade ago. His directorships inside the group rose from 235 in 2007 to almost 500 last year, as entities such as China Trademark LLC and Trump Marks Egypt LLC were formed. But few of these vehicles generate income; if anything, they are evidence of disorganisation and disappointed ambition.

Second rate on Fifth Avenue

The Trump Organisation could now profit from the presidency in two ways. First, the profits of existing assets could rise. *The Economist* has obtained data on hotel-room prices from an online travel agent. If the value of the Trump brand had risen during the election campaign you might expect a surge in prices. During 2016 the average room rate per night for a Trump-branded hotel in America fell by 1%, in line with other 4- to 5-star hotels. True, in November there has been a 12% spike in prices compared with a year earlier (see chart on next page). But even if this is maintained it is unlikely to flow directly to the group's bottom line. Most hotel-franchising fee deals are long term and insensitive to trading conditions. Likewise the tenants of commercial office properties that Mr Trump owns will have long-term leases. So ▸▸

even if the prestige of the brand rises, it may take many years—more than four—for that to translate into higher cashflow.

What has risen fast is the volume of rooms sold in the group's hotels, which is up by an average of 40% in 2016. That is due mainly to the opening of a hotel in Washington, DC which, unusually, Mr Trump owns. And that in turn illustrates a simple fact: to profit from Mr Trump's stint in office, the Trump Organisation will have to rely on a second approach, creating new, majority-owned assets and projects.

Negotiating a rash of new hotel, golf course and skyscraper deals would be hard. The commercial real-estate market in New York is soft: having risen by an average of 9% a year in the past half-decade, rents have been flat in 2016. The number of Americans playing golf has dropped by a fifth since 2005. The global hotel industry is saturated after a 20-year building boom. Trump Inc's record of finishing projects and picking partners is patchy—a big development in Baku, the capital of Azerbaijan, has stalled, for example.

A new problem may be bank finance. Big banks play a vital role in the industry: Lodha, the Indian developer, says JPMorganChase is an investor in its projects; Mr Trump owed over $120m to Deutsche Bank according to his 2015 filing. If new Trump projects are subject to claims of conflicts and cronyism, global banks that are exposed to litigation and congressional hearings in America may not stump up. Loans from state-owned banks in the emerging world may be prohibited by the constitution's ban on payments to the president from foreign governments.

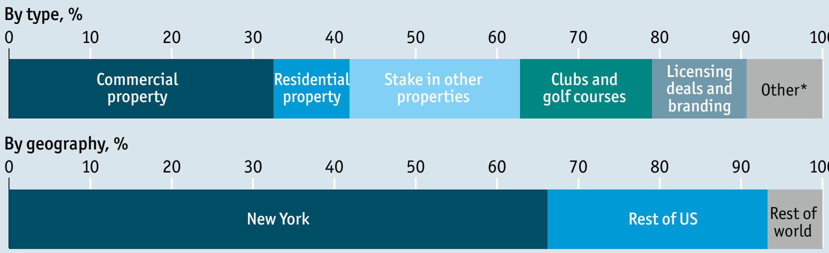
Poor performance could prompt Trump Inc to try and diversify into less capital-and-debt intensive products sold directly to consumers. Mr Trump's daughter, Ivanka, runs a fashion and jewellery brand. If Mr Trump's children take over management of the firm, as he proposes, they may feel liberated to experiment.

It seems likely that President Trump will inevitably blur the lines between business and politics in potentially disturbing ways—expect grubby deals and murky meetings. But it is less clear that his firm's value will soar. With old assets in mature industries, a patchy record, disrupted management and controversies over conflicts of interest, Trump Inc's value could stagnate or fall. And that, rather than the thrill of fresh billions, could be what really distracts America's new leader. ■

In a nutshell

The Trump Organisation's estimated value, 2015

Total: $4.3bn



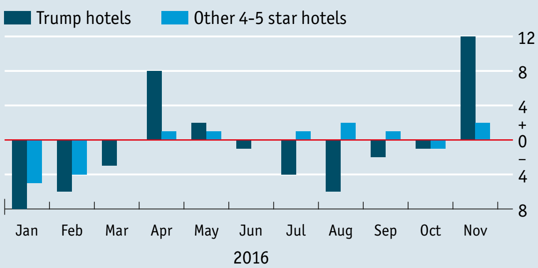
Property
The bulk of the group's property portfolio is in New York, including his flagship Trump Tower in Manhattan. Trump Inc also owns a 30% passive stake in two buildings controlled by Vornado Realty Trust, 1290 Avenue of the Americas in New York and 555 California Street in San Francisco. The firm's main trophy properties were acquired a decade or more ago. The group also appears to have licensed its name to new residential skyscrapers in India and the Philippines. A development in Azerbaijan has stalled.

Hotels
The Trump Organisation owns a handful of hotels, including one in Washington, DC. It also licenses the Trump name to hotel developers around the world in return for a fee. Trump-branded hotels are operating in Toronto and Panama. The Trump Organisation says that projects are in development in Rio de Janeiro and Vancouver.

Clubs and golf courses
About 17% of Trump Inc's value sits in clubs and golf courses. The largest is Mar-A-Lago Club in Florida—this was bought in 1985. More recently the group's strategy has been to buy declining clubs and courses in America and try to revive them. It also owns golf courses in Scotland and Ireland.

Structure and liquidity
Mr Trump is a director of almost 500 legal entities but the vast majority appear to be empty shells that make no money. About 75% of the Trump Organisation's value sits in 15 subsidiaries. It had an estimated $170m of cash, mutual funds and equity holdings. Its debt is approximately $500m, meaning it is modestly leveraged.

Hotel rooms
Average daily rate, % change on a year earlier



Source: *The Economist*

*Includes cash and securities

Samsung

Ponying up?

SEOUL

A scandal ensnares the Korean giant

IT WAS the third raid on the Samsung group in as many weeks. On November 23rd state prosecutors combed more offices of the South Korean consumer-electronics firm, part of a probe into an influence-peddling case that could be the undoing of President Park Geun-hye's administration. The deepening inquest compounds a miserable few months for Samsung, which recently recalled 3m faulty washing machines and killed a new line of Galaxy Note phones after dozens exploded due to flawed batteries.

Last week prosecutors accused Ms Park of conspiring to coerce 50-odd companies to funnel 80bn won ($70m) to two foundations, Mir and K-Sports, controlled by Choi Soon-sil, a confidante indicted for abuse of power. The biggest grant, 20.4bn won, came from Samsung. Prosecutors suspect that it funnelled a further €2.8m ($3m) to Ms Choi through Widec Sports, a German company she used to buy horses and equestrian lessons for her daughter, a dressage athlete.

Investigators had said that the firms, including many in the pantheon of South Korean business, such as Lotte, a retail giant, and SK Group, a conglomerate, both of whose offices were raided this week, paid up to avoid blowback like tax audits. Now prosecutors appear to be probing allegations of kickbacks. This week they also raided the offices of the state-run National Pension Service (NPS). According to Yonhap, a news agency, they suspect Ms Park's office of pressuring the NPS to vote for a merger in July 2015 between Cheil Industries, a Samsung business, and Samsung C&T, its construction arm. As C&T's biggest shareholder, the NPS's vote was decisive.

The merger was contentious because of a huge disparity in the two firms' valuations. Through cross-shareholdings, it allowed Lee Jae-yong, son of Lee Kun-hee, Samsung's chairman, to gain stakes in key affiliates at no extra cost. Advisory firms such as ISS pressed C&T shareholders to reject it; Elliott Management, an American hedge fund, fought it.

The NPS this week defended its vote for the merger. Samsung only confirmed the raid had happened. The group has not been under such scrutiny since it was last raided, in 2008. That year the elder Mr Lee was indicted for tax evasion and breach of trust. He stepped down, spent no time in prison and returned to the helm within two years after a pardon from then-president Lee Myung-bak.

Facebook's woes

The Mark of the social beast

Fake news items are not the only problem facing the social network

"MARK ZUCKERBERG, dead at 32, denies Facebook has problem with fake news." The satirical headline, which made the rounds online this week, nicely encapsulates the most recent woes of the world's largest social network: its algorithms, critics say, filled users' newsfeeds with misinformation—and in the process influenced the American election result. But this is not the only problem the firm is grappling with. A volatile share price, privacy policies and advertising metrics have also kept Mr Zuckerberg (pictured) busy.

"News" that the Pope had endorsed Donald Trump or that a pizzeria in Washington, DC, is the home base of a child-abuse ring led by Hillary Clinton, were not confined to Facebook (nor were fake stories only a right-wing phenomenon). They often originate elsewhere, for instance on fake-news websites in Macedonia, which make good money via online ads, and on Twitter. But Facebook's algorithms give prominence to such misinformation. They are tuned to maximise "engagement", meaning they present users with the type of content that has already piqued their interest, as outrageous headlines tend to do.

Yet despite all the attention given to fake news, the other problems probably have Mr Zuckerberg just as worried. On November 18th, to the surprise of many, Facebook announced that it would buy back up to $6bn of its shares. That seemed to be in reaction to a 10% drop in its share price since it warned earlier this month that growth next year would be slower and margins lower, as ad space on its services gets tighter and it invests heavily in data centres. The buy-back signals that Facebook considers its shares undervalued, says Mark Mahaney of RBC Capital, an investment bank.

A couple of days earlier, Facebook had to admit flaws in how it measures its traffic (for the second time in just a few weeks, after disclosing that it had overestimated the average viewing time for its video ads). This time it said that other numbers, including the quantity of clicks from Facebook posts to apps or websites, were smaller than previously stated. Although this did not lead advertisers to overpay, they are likely to make new demands of Facebook, for instance to provide more data about exactly how its ads are viewed.

It has also emerged that Facebook has "paused" the ongoing process of merging its data with those of WhatsApp, the messaging app it bought in 2014 for $19bn in shares. When the takeover was announced, Jan Koum, WhatsApp's founder, promised users their data would stay apart. In August Facebook reneged on the pledge, which upset various privacy watchdogs in Europe. In September the city of Hamburg's data-protection commissioner issued an order that stops Facebook collecting data from German users of WhatsApp.

Whether all this will have a discernible impact on Facebook's finances is a matter of debate among analysts. If advertisers have extra money to spend they do it where they get most bang for their buck, which, Google aside, is Facebook, says Peter Stabler of Wells Fargo Securities. In contrast, Brian Wieser of Pivotal Research recently wrote that the focus on fake news and the concerns over the measurement of advertising could well cut revenue growth by a couple of percentage points.

Whatever happens, Facebook's heft ensures that it will remain in the firing-line. It has nearly 1.8bn monthly users, or about half of the internet population, and it serves up much of what people read online. Whereas Google dominates the market for ads related to online search, Facebook rules the one based on consumers' online profiles. Together both firms accounted for all new online ad spending this year, according to Mr Wieser.

With immense size comes intense scrutiny. Yet it is not clear whether Mr Zuckerberg fully grasps this. When first asked about the role of fake news in the American election campaign, he said it was a "pretty crazy idea" to think Facebook had an impact on voters. Only when Google said last week that it would bar fake-news sites from using its ad services, did it take the same step.

In a blog post on November 19th Mr Zuckerberg both set out how the social network would deal with the problem and insisted that Facebook itself does not want to decide whether something is fake or not. But it emerged a few days later that Facebook has already developed a censorship tool, to be used in China should the firm be allowed back into the country, underlining that it knows precisely how to filter its content when it wants to.

Some of these issues are easier to deal with than others. It should be straightforward enough to deal with any suggestion that Facebook is tricking advertisers. Answering the accusation that it is hurting democracy and violating people's privacy raises far harder problems. In America almost half of adults now get their political news on Facebook. No other online firm, not even Google, has more data about consumers. More transparency would improve things across the board. So would an acceptance by Mr Zuckerberg of just what a heavy responsibility he now bears. ■

Silicon Valley and food

Pie in the sky

MOUNTAIN VIEW

Technology companies may struggle to disrupt America's food industry

THE office parks of Silicon Valley boast many firms that are trying to change the world. But there are plenty with more modest goals. Zume Pizza, a tiny startup that is located a few miles from the sprawling headquarters of Google, wants to redesign the way pizzas are made. Zume has programmed robots to make pizzas that are then put into a van and baked as they hurtle towards customers. Ovens are timed to finish cooking in sync with the vehicles' arrival at their destination, so the pies are always piping hot.

In recent weeks spies from rival pizza companies and from food-delivery firms have been driving by in unmarked cars taking photographs of the office and the vans, says Julia Collins, one of Zume's co-founders. To protect its business, the startup has patented the whole process of cooking food in ovens while a vehicle is moving (the patent probably gives Zume defensible intellectual property, says one patent lawyer). The company only operates in Mountain View, but has expansion plans. Since its founding last year it has reportedly raised $6m from investors, among them Jerry Yang, a co-founder and former boss of Yahoo, an early giant of the internet.

Tech entrepreneurs have not spared the ▸▸

food industry, but their principal focus has been on delivery services. Actually making the food represents a fresher opportunity. Restaurant chains have been slow to invest in technology themselves because the cost of labour is usually fairly cheap, says John Glass, an analyst at Morgan Stanley, a bank. They have spent money on mobile payments and on online ordering, but there is scope for more innovation.

Disrupting food is not easy, however. The Melt, a fast-food chain that specialises in grilled cheese sandwiches, has boasted about its proprietary technology, including a "smart box" that it developed with former engineers from NASA to keep sandwiches warm during deliveries. The chain has not been a great success and it has replaced its chief executive. Another startup, Hampton Creek, which has raised more than $120m from venture capitalists in order to create a vegan, environmentally-conscious version of mayonnaise and other kitchen staples, is now reportedly facing an inquiry into whether it bought its own products to inflate lacklustre sales figures (its CEO has denied any such purpose).

It is entirely possible that Zume has anticipated the eventual, widespread adoption of robots in restaurants, together with new systems for cooking meals. But startups face several big hurdles to success.

Scale is hard to achieve. Zume may not be able to afford many robots, which move the pizzas off a conveyor belt in its office-cum-factory after spraying them with tomato sauce. Humans still add the toppings before the pies go into the vans. The robots cost around $100,000 each, or the equivalent of hiring two experienced employees for a year, says Alex Garden, Zume's other co-founder. He reckons that buying them will pay off rapidly. That may be true, but Zume's strategy is a capital-intensive one by the standards of most digital companies; it also owns all of its vehicles.

Competition is of course fierce. It will take a long time for Zume to make any dent in the share of big established brands. The largest firms—Domino's, Pizza Hut and Papa John's—have in recent years taken even bigger slices of the pizza market, which is worth an estimated $34bn in America. Such giants will surely start investing in technology properly in time. Tech-enabled delivery services also have lots of heft. One, Postmates, recently raised around $140m.

And reinventing food can be fraught. Zume's product has the familiar taste of average pizza. But technologists can get things badly wrong. Soylent, a startup that offers drinkable meals that are popular among engineers who are too busy coding to eat, has recently stumbled. The algae it included in some of its products turned out to cause stomach problems. Food may be one realm where people do not mind getting stuck with version 1.0. ■

Consumer goods

The riches in returns

NEW YORK

Americans return goods worth billions each year. What happens to them?

IN STORES and warehouses across America, they wait: towers of toys, scarves piled on scarves, box upon box of shoes. The official start of holiday shopping in America begins on "Black Friday" on November 25th. Retailers hope to sell more than $650bn of goods this season, roughly the annual economic output of Switzerland. Ideally, companies' supply of products would precisely match demand for them. In reality millions of items will stay on shelves or get sent back after purchase—in all of 2015 Americans returned goods worth $261bn, out of a total $3.3trn sold. What happens next?

Some returned goods will be resold by the very same retailer, but many will not. By the time an item is returned it might be either damaged or stale, points out Steven Barr of PWC, an accounting firm and consultancy; shops might want to offer newer wares. And resale is not an option for the stacks of goods that are never sold at all.

For retailers and manufacturers, this is a big headache. Dealing with unwanted goods can amount to a tenth of the cost of making and distributing them in the first place. But for a whole string of logistics firms, discount chains, brokers, dollar stores and more, they are a big earner.

Logistics giants are vying with each other to make returns as speedy and simple as possible. Last year, for example, FedEx spent $1.4bn to buy GENCO, a specialist in so-called "reverse logistics". The world's top clothing retailer is now TJX, which snaps up surplus inventory and shifts it at a discount. Lots of smaller firms make money from returned goods, too: a motley collection of companies transport, evaluate, dispose of and resell goods that mainstream retail has snubbed. Some have big backers. Last year KKR, a well-known private-equity firm, invested in a company called Channel Control Merchants, which calls itself an "extreme-value" retailer and exporter of excess inventories.

There are many paths for a rejected item to take. The most sophisticated firms plot possible routes in advance, before goods even go on sale, so that a product can be redirected quickly once it is rejected and sent to a warehouse. For example, GENCO and JDA Software, a company based in Arizona, each offer computer programs that ask questions of warehouse workers to help them decide where various products should go next.

Many excess goods suffer an uglier fate. Valuable ones are often incinerated or ground up to preserve a brand's aura of desirability. Neither retailers nor brands divulge which products are subjected to such treatment. Many goods will end up going into landfill.

The most eventful second life for returned products occurs when they are sold by the pallet or truckload. They are often mined for parts or overhauled in various ways to be ready for resale at low prices. That can even involve defacing them. Inmar, which offers an array of reverse-logistics services, is often asked to cut labels from apparel, so someone can't try to return items to a store. Such anonymisation also leaves a brand untarnished, as its clothes are then flogged on a global bazaar for unwanted items that is known as the ▸▸

Can I send him back, too?

secondary market.

This market is vast and complex. Sales for the American part alone reached just over $486bn in 2014, according to research by Dale Rogers of Arizona State University and Zachary Rogers of Colorado State University. Their measure includes many types of sales. Some take place within retailers' outlet stores. A section of Amazon's website sells "gently used" items at low prices. Dozens of small third parties are keen to buy excess inventory, too: there is the giant TJX but also small dealers that resell goods to the Amish in rural communities, among others.

One complication is that retailers and manufacturers, who are keen to exert at least some control, set rules for the types of buyers they will allow. Some want to sell only to exporters. GENCO has some customers that want sales within America, but only at stores more than 50 miles from their own shops.

Mr Rogers reckons that sales for the secondary market rose by 31% from 2010 to 2014 and that they are set to rise much further. More e-commerce means more returns, as customers buy goods without seeing them, often in several sizes, then send back what they don't need. American e-commerce sales are expected to be about 50% larger in 2020 than they were in 2015. What the secondary market lacks in glamour, it makes up for in growth. ■

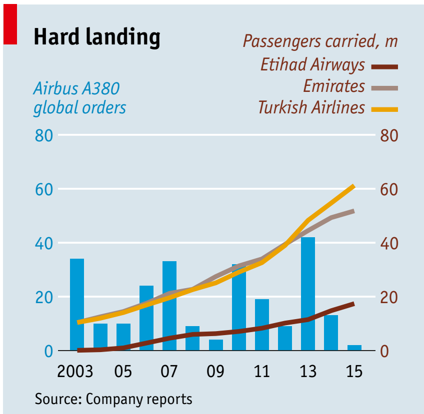
Emirates and the A380

Flying low

Problems at Emirates strike another blow to the super-jumbo

AT THE world's major airports, plane-spotters often spend days waiting for the world's largest passenger plane, the Airbus A380, to make an appearance. The nerds at Dubai International Airport are spoilt for choice. It is home to Emirates, an airline that owns 86 of the monster aircraft, almost half of the global A380 fleet. These planes have propelled Emirates from insignificance a decade ago to its position as the world's biggest carrier (measured by international passenger mileage in 2015). Now the airline has hit a rough patch. That is bad news for Airbus, the European aerospace and defence giant which makes the A380, and for the plane itself.

Demand once seemed insatiable for flights through Emirates' hub in Dubai, which is known in the industry as a "super-connector" airport. Now its location helps explain the airline's difficulties as well as its spectacular past growth, says its president, Sir Tim Clark. When he helped set up the airline in 1985, he says, Dubai was "an enchanting Arab village" that generated little air traffic. Instead of filling up the planes with locals, his strategy was to use its position halfway between Asia and Europe to connect flights between cities that lacked obvious links, such as Cairo and Shanghai or Moscow and Cape Town.



Connecting these "strange city pairs", as he puts it, led to soaring passenger numbers. A string of purchases of A380s, starting in 2008, helped traffic to more than double to 51m in 2015. Good airport facilities and access to cheap labour (even expatriate pilots are inexpensive in Dubai because of low taxes) contributed to profits as well: the airline has the lowest costs of any long-haul carrier in the world.

But over the past year or so problems have mounted. Low oil prices have hit the economies of many of Dubai's neighbours, reducing regional passenger traffic. Terrorist attacks in cities and airports in Europe and the Middle East have dampened tourism activity generally.

Although Dubai itself is safe, conflict in Iraq, Syria and Yemen, as well as Turkey's attempted military coup in July, are prompting passengers to choose other connecting cities. Currency volatility has also meant abrupt drops in revenue on some routes. "We used to have one of these business-damaging events once a year but now we have them more than once a month," groans Sir Tim. In the year to March, Emirates made a record $1.9bn in profits, but since April its earnings have tumbled by 75%. Weak demand has forced it to slash its fares to keep planes full.

Emirates can take some solace from the fact that its super-connector rivals in the Middle East—Etihad of Abu Dhabi, Qatar Airways and Turkish Airlines—are also hurting. Turkish Airlines has had to suspend flights on 22 routes and mothball 30 planes. Industry analysts reckon the airline will this year suffer its first annual loss for a decade. Qatar and Etihad may also end up in the red.

Tricky geopolitics is nothing new for Emirates, which was founded during the Iran-Iraq war, argues Sir Tim. Dubai is trying to boost its own tourism industry, which should help replace some of the connecting passengers the airline is losing. No one doubts that it will pull through.

Emirates' appetite for the A380 is a different story. That may dwindle more quickly than Airbus had anticipated. On December 2nd the first planes in a new batch of super-jumbos are due to arrive in Dubai. In total, Emirates has a further 56 A380s on order: 31 are to be delivered between now and 2019, with another 25 due to arrive in the 2020s to replace older ones nearing retirement. Emirates rescued the A380 programme with its last big order in 2013. The airline had wanted to buy another 200 A380s equipped with more fuel-efficient engines. But in current conditions Sir Tim says there is little chance of his airline making another large order anytime soon.

Airbus has orders for only another 18 super-jumbos from other airlines that are likely to be delivered and paid for, according to Richard Aboulafia of the Teal Group, a consultancy in Virginia. The manufacturer has already cut planned production, but may still run out of customers for even this diminished number.

So Airbus is on the hunt for new buyers in China and Japan, places where runways are most congested and the need for larger planes is most acute (the firm originally gave the A380 its name because eight is considered lucky in some Asian countries). Chinese airlines have only bought five so far but the hope is they might buy more now that the country's aviation regulator, a noted super-jumbo sceptic, retired earlier this year. If they are not willing to step up, as Emirates once did, plane-spotters will have even more reason to cherish their sightings of the A380. ■

Big bird

Schumpeter | Status contentment

It's getting easier for the merely rich to live like tycoons

LAMENTING the rise of inequality is one of the few growth industries in an age of stagnation. One authority on the American wealthy, Robert Frank of CNBC, a TV channel, worries that the rich are "floating off" into their own country. Chrystia Freeland, a journalist-turned-politician, frets about the rise of the "new global super-rich" and the fall of everyone else. Charles Murray, America's gloomiest social scientist, warns that society is "coming apart" as the rich retreat into their gated communities.

At the top of the income scale, however, a small counter-trend is observable. Never before have so many people been able to get access to the accoutrements of tycoonery—private planes, luxury yachts, fancy cars and interior-designed, exclusive homes. There is only so much comfort to be had from the fact that it is easier for the merely rich to lay claim to the lifestyle of the super-rich. But as a result of a combination of new technologies and businesses, that is nonetheless what is happening.

Tycoon living begins with a private jet. Whereas yachts are dispensable (not everyone wants to float around for weeks with the same dinner companions) private jets are necessities for the aspiring billionaire. They save valuable time. Even first-class passengers have to wait an hour or so for their flights. Private-jet owners can turn up when they want and climb on board. The planes can double as flying offices, and you don't have to worry about other passengers eavesdropping on your deals or objecting to your spreading papers. The flight is smoother (private jets typically fly at 45,000 feet), the seats are more throne-like, and you can bring your pets.

No longer do you need a net worth in the hundreds of millions of dollars to have one. With 700 jets, NetJets is now the fifth-largest airline by number of planes, after Southwest Airlines, and it has access to thousands of private airports. Its main innovation was to apply the principle of fractional ownership, or time-sharing, to the ultimate executive tool. Customers buy a share in a jet which entitles them to, say, 200 hours of travel a year.

NetJets is skilled at providing its rich clients with an entrée into the cultural world of the super-rich, with hard-to-get tickets to events such as Art Basel, a series of art fairs, and to private dinners with celebrities. The company is also finding ways to bring down the cost: one of its latest ideas is the private-jet equivalent of London Underground's electronic ticket, the Oyster card. Rather than buying a share in a jet you can buy a pre-paid card that entitles you to a certain number of flying hours a year, with 25 hours' worth of flights adding up to about €155,000 ($163,435).

The sharing economy was hardly inspired by the needs of the rich. But in some ways it suits them perfectly. The whole idea depends on people having spare assets that they are willing to rent out to total strangers. Who has more idle assets than the super-rich? And who loves extra income more than people who have spent their lives accumulating money? On the other side of the market, bustling plutocrats are an ever-present source of demand for temporary accommodation and bursts of luxury. The system can even have a strange public-relations benefit. A wealthy boss who makes use of NetJets won't need to explain to his shareholders why he bought a jet, even as he treats the one he flies on as though it were his own.

Uber, a ride-hailing firm, and Airbnb, an accommodation-sharing service, are prominent in the luxury market as well as the mass market. Uber offers yacht trips in Dubai (UberYacht) and helicopter commutes in São Paulo (UberCopter). Airbnb does a booming trade in luxury apartments in London, Hong Kong and the Caribbean. There are providers in almost every cranny of the luxury landscape. GetMyBoat, a San Francisco-based company, gives customers access to motorboats, luxury houseboats, yachts and jet skis in 7,100 places around the world. Stratajet sells tickets on empty legs on private jets for the price of a business-class ticket or even less. Staller, which describes itself as the "Airbnb for horses", helps horse-owners rent stalls near equestrian competitions. A home-sharing club called ThirdHome.com allows people with just a couple of homes to live as if they have a dozen.

The same constraints that affect the wider sharing economy—NIMBY pressure groups who put their interests above the common good and regulators who fail to adapt to new technology—find echoes in the luxury market. With its helicopter service from Manhattan to the Hamptons, Blade has immeasurably improved the life of those New Yorkers who weekend on Long Island. That hasn't prevented curmudgeons in Battery Park and Brooklyn Heights from complaining about the occasional whump-whump-whump over their heads.

From merely rich to Uber rich

Methods of managing wealth as well as consuming it are trickling down. Until recently only people called Rockefeller and Morgan could afford so-called "family offices" that manage their investments, taxes and charitable giving (and get entry into the best hedge funds). Now people with as little as $5m to invest can afford to do so thanks to a boom in so-called "multi-family" offices. Banks such as Citigroup have set up multi-family divisions. Even blue-blooded wealth advisers such as Rockefeller & Co, in Manhattan, are offering family-office services to the "merely" crowd.

That things are getting better for more rich people does not contradict Mr Frank's broader worry, but among the Art Basel class it is a notable shift. Once upon a time you had to be born rich to join the global elite. Then you had to make a hundred million dollars, and then the threshold rose to a billion. Now goods and services that used to be confined to a handful of tycoons are available to the millionaire or pretend-millionaire next door, thanks to the magic of the sharing economy. The super-rich may be floating off into their own country. But more people can join them, even if temporarily, than ever before. ■

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Financial regulation (1)

On fire

NEW YORK

After the election, bankers look forward to dancing around a bonfire of rule books

BEFORE the presidential election, Wall Street dreaded Donald Trump as a dangerous, unpredictable and disruptive, if improbable, president. Since his victory, fear has turned to hope. Stockmarkets are at record highs and shares in financial institutions have been among the best performers. Mr Trump, it turns out, looks to big finance like good news.

Partly this reflects Mr Trump's change of tack. He campaigned as the leader of a rustbelt revolt against the besuited, pampered elites. As president-elect, he seems less of an outsider. Among the rumoured names he has been mulling as his choice for treasury secretary are Jamie Dimon, boss of JPMorgan Chase, and Steven Mnuchin, a 17-year veteran of Goldman Sachs. Wall Street's access to the corridors of power seems likely to be unimpaired.

But the euphoria mostly reflects the finance industry's excitement at one of the more achievable of Mr Trump's campaign promises: to cut red tape. In a YouTube video this week outlining his priorities, he announced a new rule: for every new regulation, two old ones must be eliminated. No industry in America feels as browbeaten by regulators as does finance. It awaits the bonfire of the rule books with glee.

In this context, a speech on November 18th by Mary Jo White, the outgoing chair of the Securities and Exchange Commission (SEC), amounted to a swansong for the Obama administration's approach to finance. Clearing up the wreckage of the 2008 crisis, Barack Obama encouraged a punitive approach to the industry. ("You don't want to mess with Mary Jo" was his character reference). In her speech she outlined a "new" and "unrelenting" model for combating white-collar crime. But she, and an entire layer of Obama-appointed regulators, are on their way out.

By February, with the start of the Trump administration, their regulatory legacy may also be under threat—whether the celebration of large dollar settlements from errant institutions or the production of ever more rules. Defining this approach was the Dodd-Frank act, enacted in 2010, which Mr Trump has vowed to dismantle. The act is so sprawling that 30% of its 390 distinct rules have yet to be adopted, according to Davis Polk, a law firm.

Even executed partially, Dodd-Frank had vast consequences. A study by George Mason University's Mercatus Centre, using data up to 2014 (when only 59% of the rules had been adopted), showed that Dodd-Frank had already led to 27,669 new "regulatory restrictions". This tally excluded components of Dodd-Frank too large to be quantified, such as Section 1502 which gave the SEC a role in monitoring corporate supply chains in the interest of blocking minerals from certain African countries.

Dodd-Frank is so intricate that, like the institutions it is supposed to constrain, it seems too big to tame. In fact, it has three features that make it malleable—fragile, even. The first is that many of its rules must be implemented by agencies, which can thereby reshape them and pick and choose among them. The second is that the authority to do so is often protected from outside tampering. "The great irony of Dodd-Frank," says J.W. Verret, a law professor at George Mason University, "is that all that discretion can be used to limit regulation."

This is particularly true because of a third characteristic. It funnels authority through a small number of crucial presidential appointments. Mr Trump will have the right to nominate a vice-chairman of the Federal Reserve in charge of regulation, displacing Daniel Tarullo, who is considered by many banks to be the single most important federal regulator. The new president will also be able to nominate every board member of the Financial Stability Oversight Council, a Dodd-Frank creation which determines which institutions are too big to fail. And he will be able to appoint the director of the Consumer Financial Protection Bureau, a controversial agency also spawned by Dodd-Frank.

When the facts change

A proposed rewrite of financial regulations by Jeb Hensarling, chairman of the important congressional committee on finance (and another candidate for treasury secretary), would rein in these entities. In the past, Democrats would have opposed this. They may think differently now that they will be controlled by Mr Trump.

The new president will have opportunities, through appointments, to change more established departments, too. At the SEC Ms White's departure will leave only two of five commissioners and deep divi- ▶▶

sions over big issues such as disclosure by companies and funds, the structure of equity markets and the lack of a coherent plan for "capital formation" (ie, matching capital with entrepreneurs). Mr Trump will be able to nominate commissioners at once, which would transform the SEC's agenda.

Unlike the SEC, both the justice and labour departments have been hyperactive over the past eight years. The Department of Justice played a central role in prosecuting financial offenders. Cases were often settled for large sums, but these left no enduring legal principle that the new attorney-general will have to follow. The Department of Labour aggressively expanded its remit, most notably because of the adoption of a simple-sounding but vastly complex new regulation, the Fiduciary Rule, which gave it a key supervisory role over $3trn (and counting) in retirement savings. Revoking that will not be easy. But the new labour secretary, again a Trump appointment, can delay implementation and otherwise temper adoption.

Since the election, formal comments by the Trump transition team have been brief, largely calling for an end to bail-outs and red tape, and more capital for small businesses. A first phase of reform may be structured to capture Democratic support: a narrow bill offering regulatory relief for community banks and imposing restrictions on bail-outs. But more may follow. A new version of Mr Hensarling's plan is believed to be in the works. Paul Atkins, a former SEC commissioner with libertarian leanings, is heading a transition team covering the regulatory agencies.

The new administration has more pressing priorities than changing financial rules, notably trade, immigration, taxes and infrastructure spending. But Wall Street knows it is in Mr Trump's sights. And it seems to relish the prospect. ■

Buttonwood | Charging the earth

The British mutual-fund industry is not sufficiently competitive

BANKS tend to grab the headlines when it comes to financial scandals and systemic risk. But many people have a lot more money squirrelled away with the asset-management industry, in the form of pensions and lifetime savings, than they do in their bank accounts. A new report* from one of Britain's regulators, the Financial Conduct Authority (FCA), suggests that the industry is not doing a great job at looking after investors' interests.

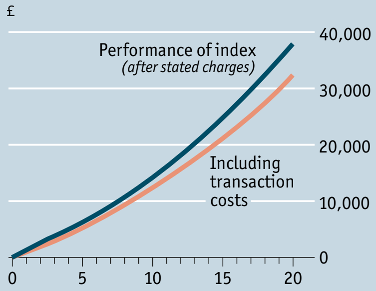
The British fund-management industry is huge, with some 1,840 firms managing around £6.9trn ($8.6trn) of assets. With the ten biggest fund managers representing only around 47% of the market, competition ought to be pretty intense. But the FCA report finds that fees in the actively managed sector (ie, funds that try to beat the market by picking the best stocks) have barely shifted in the past ten years. Operating margins across a sample of 16 fund-management firms have averaged 34-39% in recent years, one of the highest of any industry. Profits that heady smack more of an oligopoly than of a cut-throat battle for business.

There is one part of the market where fees have come down—passive, or tracker, funds that try to match an index. Their fees have fallen by more than half since the turn of the decade. Passive funds are gaining market share but not as quickly as you might expect. One reason may be the reluctance of financial advisers to recommend them. The FCA found that passive funds did not feature at all on the main "best-buy lists" of advisers before January 2014 and still comprise fewer than 7% of the funds on such lists.

The underlying problem, at least when it comes to retail clients, is that fund managers do not compete on price at all. Part of this is due to many investors' ignorance. Remarkably, more than half of retail investors surveyed by the FCA did not know that they paid charges on investment products. Surveys show that many people are hazy about percentages or basic concepts such as compound interest.

Passive-aggressive

Returns on a £20,000 equity fund over 20 years*



Source: Financial Conduct Authority

*Assuming average FTSE all-share growth

Instead, fund managers seem to compete on the basis of past performance, with some 44% of retail investors saying this was an influential factor in picking a fund. Advertisements for funds often highlight the stellar returns previously achieved.

Launch enough funds (around 36,000 are available across Europe) and some are bound to be successful. Asset managers simply bury their failures. Of the equity funds available to British investors in 2006, only about half are still around in 2016; the others were merged or liquidated. As the report remarks: "This may give investors the false impression that there are few poorly performing funds on the market."

In chasing performance, investors are pursuing a chimera. The FCA finds, like others before it, that active managers underperform the index after costs (see chart). And it finds little evidence of persistence in outperformance. It looked at the best-performing quartile of funds over the 2006-10 period and examined how they performed in the next five years. Just under a quarter stayed in the highest quartile, exactly what chance would suggest. More than one-third of the stars of 2006-10 slipped to a bottom-quartile ranking—or were closed or merged.

It is hardly surprising that, if investors seem unconcerned by cost, charges stay high. But it makes a big difference to their wealth. Over 20 years, the FCA calculates, an active manager's charges can eat up a third of an investor's return.

Each investment company contains an "authorised fund manager" board whose aim is to ensure that the fund meets its regulatory and legal responsibilities. But board members are employees of the firms they are monitoring and, the FCA notes, "generally do not robustly consider value for money for fund investors."

It is in the interest of asset managers for funds to grow as large as possible, since they earn a fee based on the size of the fund. There are economies of scale associated with managing a large fund but the report found that these savings were not passed on to retail investors. That is just one example of how no one seems to be looking after the client's interests.

All in all, this interim report points to a litany of failings in the industry. Yet the FCA's suggested reforms—strengthening the duty of managers to act in the interests of all investors, for example—may turn out to be quite modest in scale. If this were any other industry (electricity generation, say) the public would demand more robust action. The FCA should wield a bigger stick.

* "Asset Management Market Study: Interim Report", November 2016. https://www.fca.org.uk/publication/market-studies/ ms15-2-2-interim-report.pdf

Economist.com/blogs/buttonwood

Financial regulation (2)

Basel bust-up

A showdown looms over revisions to global bank-capital rules

THEY lack the magic of "Harry Potter" and provoke even less laughter than "Police Academy", but the sequels keep coming. In Santiago on November 28th and 29th the committee of central bankers and supervisors from nearly 30 countries that draws up global bank-capital standards is due to thrash out revisions to Basel 3, the version agreed on after the financial crisis of 2008. European (and some Asian) bankers and officials fear additional capital requirements are coming; Americans are all for the changes. Stand by for a stand-off in Chile.

Spurred by Basel 3, banks have stuffed billions into capital cushions that the crisis showed to be woefully thin. Between mid-2011 and the end of last year, 91 leading lenders bolstered their common equity by €1.4trn ($1.5trn), or 65%, according to the Bank for International Settlements (BIS), which provides the Basel committee's secretariat. The ratio of equity to risk-weighted assets, an important regulatory gauge, climbed from 7.1% to 11.8%. Although Basel 3 need not be fully honoured until 2019, most banks are far above the minimum of 4.5% (additional buffers, some at national level, raise the actual floor much higher).

But the committee has been taking a closer look at banks' calculations of risk-weighted assets. It has concluded that banks' internal models vary too much: in an exercise in 2013, in which it asked 32 lenders to assess the required capital ratio for the same hypothetical credit portfolio, the highest answer was four percentage points above the lowest. Some banks, it believes, are too sanguine about credit risk.

So the committee has suggested restricting the use of banks' in-house models in assessing loans to large companies and other banks, and in specialised lending such as project finance. (Because defaults are rare, the reasoning goes, there are not enough data to model risks well.) Where banks' own models are used, it wants minimum values for important parameters, such as the probability that loans go bad. And it is considering an "output floor"—a lower bound for the risk-weighted sum of their assets—of 60-90% of the figure calculated under a "standardised" method.

Supervisors and ministers have said that the changes should not "significantly" raise "overall capital requirements". But some lenders can expect an increase. The proposed standardised approach, for instance, weights residential mortgages worth 60-80% of the value of the property at 35%: in Denmark or Germany, say, where defaults have been rare, banks' models imply little risk and lower weights. When loans of all sorts are totted up, several internal calculations of risk-weighted assets are likely to be below the output floor. Substituting the floor for the internal figure boosts risk-weighted assets, depressing the capital ratio.

Analysts at Morgan Stanley estimate that global, non-American banks could see risk-weighted assets rise by an average of 18-30%, depending on the level of the output floor. Extra capital of €250bn-410bn could be needed, a tall order when earnings are thin and investors wary. The committee's reviews of operational and market risks would add even more.

European banks complain of being forced into an American-designed straitjacket. Higher capital requirements, they complain, will crimp lending and growth—although research by the BIS suggests that better-capitalised banks have lower funding costs and lend more, not less. American banks will be little affected by the credit-risk proposals. They sell most mortgages to Fannie Mae and Freddie Mac, two government-owned entities, whereas European lenders keep them on the books; American companies borrow from markets rather than banks. Americans retort that their post-crisis supervision has been stricter than in Europe and that they were quicker to knock themselves into shape.

European officials are also speaking up. This month Andreas Dombret, a senior official at Germany's Bundesbank, said that the restrictions on model parameters were too tight and that there was no need for an output floor. "The Bundesbank", he warned, "is not prepared to reach an agreement at any price." Valdis Dombrovskis, the European Union's financial-services commissioner, who would have to put the changes into EU law, has said more work is needed. (Separately, on November 23rd Mr Dombrovskis set out legislation intended chiefly to put the current rules into effect.)

There may be some wriggle room. Banks may be given more flexibility in using models for corporate and specialised lending. Rather than apply the same rules everywhere, Europe's supervisors could adjust them for local conditions: Swedish banks must already weight mortgages at 25%. A long phasing-in period may also soften the impact. But a tricky two days lie ahead. No one dares mention Basel 5. ■

Japan's bond market

Zero-sum game

TOKYO

The Bank of Japan v the Trump effect

HARUHIKO KURODA is not a man to be put off by an unexpected setback. On November 17th the governor of the Bank of Japan (BOJ) gave his defiant take on the implications for Japanese monetary policy of the global market gyrations that have followed the surprise election of Donald Trump. Interest rates, he noted, have risen in America. "But that doesn't mean that we have to automatically allow Japanese interest rates to increase in tandem."

A sell-off triggered by Mr Trump's win wiped more than $1.2trn off the value of the world's bond markets as investors bet that his administration will stoke America's economic engines and drive up inflation. Bond yields rose sharply around the world as investors sold assets to buy dollar-denominated ones. In Japan the yen weakened and the yield on ten-year government bonds (JGBs) crept above zero for the first time in nearly two months. Since he was appointed by Shinzo Abe, the prime minister, in March 2013 as custodian of the monetary wing of "Abenomics", Mr Kuroda has been fighting to end years of debilitating deflation. Keeping bond yields down is an important part of that struggle.

Under his tenure, the BOJ has been printing money to buy government bonds. In 2014 it expanded this quantitative-easing programme from ¥50trn ($445bn) to ¥80trn a year. The BOJ now owns around ▸▸

40% of the total JGB market. And in February this year it fired off one of its biggest bazookas yet, cutting its benchmark interest rate to -0.1%. Critics accused Mr Kuroda of intensifying a failing strategy. But in a bid to ward off speculation that the bank might retreat from its aggressive easing, Mr Kuroda gave a defiant speech in September, promising to keep ten-year JGB yields at around zero until inflation overshoots its target rate of 2% for an unspecified period. That now looks even harder than it did.

For Mr Abe, the prime objective is to tackle deflation. Only if people believe prices are going to go up will they spend money now, he explained after taking office. If consumers don't spend, and businesses don't invest, the economy will be trapped in a doomed cycle. But despite moments of hope, nearly four years later the central bank is no closer to igniting inflation. Mr Kuroda blames falling oil prices and a slowdown in emerging markets. He is not helped by wages that have remained stagnant, despite Mr Abe's repeated pleas to business to raise them, and despite the record hoard of ¥242trn in cash and deposits held by corporate Japan. Whatever the reasons, it is clear that the 2% target is not within reach, says Daiju Aoki, an economist in Tokyo for UBS, a Swiss bank.

As commentators have noted, Mr Kuroda can print money, but not people. Overshadowing the economy is Japan's ageing, shrinking population. With far more deaths than births, it has fallen by about 1m since 2010. Government projections say the labour force could collapse by 40% by 2060. Meanwhile, public debt has grown to 246% of gross domestic product, the highest such ratio in the world.

Without the deep structural reforms long promised by the government, Mr Kuroda has been left with probing the boundaries of what monetary policy can achieve. The BOJ's promise of "unlimited" purchases to maintain its yield-curve target tests its ability to control the bond market. "It is often argued that there is a limit to monetary easing but I do not share such a view," Mr Kuroda said in September. He may soon find out if the markets agree. ■

Global wealth

The one per center next door

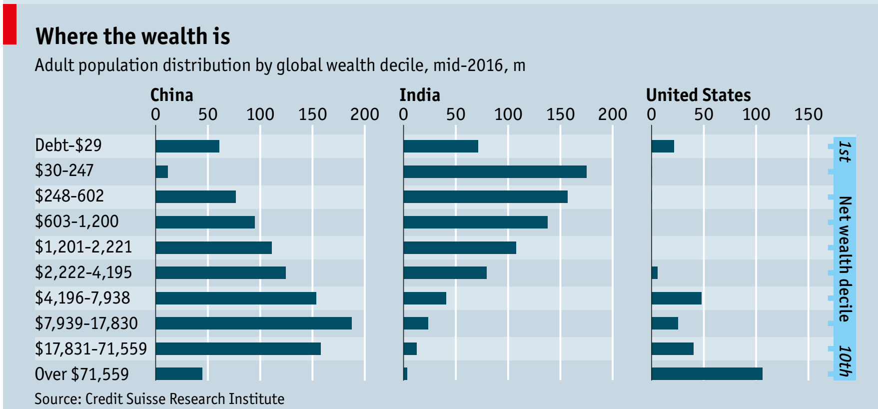
You may be higher up the global wealth ladder than you think

IF YOU had only $2,222 to your name (adding together your bank deposits, financial investments and property holdings, and subtracting your debts) you might not think yourself terribly fortunate. But you would be wealthier than half the world's population, according to this year's Global Wealth Report by the Credit Suisse Research Institute. If you had $71,560 or more, you would be in the top tenth. If you were lucky enough to own over $744,400 you could count yourself a member of the global 1% that voters everywhere are rebelling against.

Unlike many studies of prosperity and inequality, this one counts household assets rather than income. The data are patchy, particularly at the bottom and top of the scale. But with some assumptions, the institute calculates that the world's households owned property and net financial assets worth almost $256trn in mid-2016. That is about 3.4 times the world's annual GDP. If this wealth were divided equally it would come to $52,819 per adult. But in reality the top tenth own 89% of it.

That lucky tenth now includes over 44m Chinese, about 4.4% of the country's adult population. A far greater number (almost half of China's adults) cluster in the next three deciles down. Closer to the bottom of the ladder, there is a similar bulge of Indians with wealth between $30 and $603.

Below them, the bottom tenth is a peculiar mix. It is populated by poor countries, where many people have nothing, and rich ones, where people can own very much less than that. It includes a surprising number of Americans (over 21m), whose debts outweigh their assets. But most Americans are much better off. Over 40% belong to the top tenth of the global wealth distribution (and over 18m belong to the global 1%). Some of those railing against the global elite probably do not even know they belong to it.



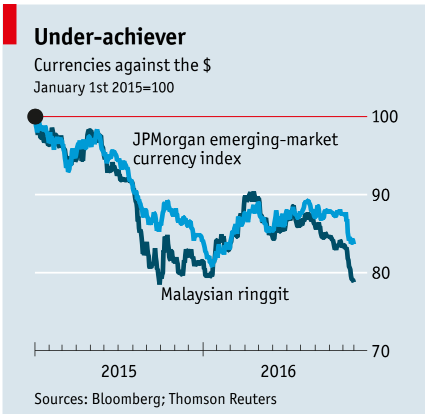
Currencies

Forward and backward

Malaysia's central bank tries to save the ringgit from offshore speculators

"THERE is no new policy on capital flows. There is no proxy capital control either," insisted Muhammad Ibrahim, governor of Malaysia's central bank, in a dinner speech on November 18th. This echoed a similar central-bank promise 15 months ago. For those hoping to bring money in and out of Malaysia, the commitments are reassuring. The frequency with which they need reiterating is less so.

It is no secret that the central bank is worried about the sharp drop in Malaysia's exchange rate. Like other emerging-market currencies, the ringgit has suffered from China's slowdown in the past two years and Donald Trump's upset victory on November 8th. But, like Malaysia's politics, beset by lurid tales of financial malfeasance, the currency has been unusually skittish (see chart on next page). ➧



Mr Muhammad blames what he calls "the arbitrary and unpredictable devices of the offshore markets". Whereas China has been keen to "internationalise" the yuan, Malaysia's central bank has an equally determined policy of "non-internationalisation". It prohibits the trading of ringgit assets outside of its jurisdiction.

International investors can nonetheless bet against the currency offshore, settling the bets in dollars rather than ringgit. These "non-deliverable forward" contracts (NDFs) allow foreign investors, who own over a third of Malaysia's government bonds, to hedge their exposure to the currency. But the NDF market can also be turned to speculative ends. And this speculation, Mr Muhammad believes, is contaminating the onshore markets as well.

If the offshore side-bets all point in one, bearish, direction, the onshore markets tend to follow their lead. And foreign banks that take the other, bullish, side of these offshore trades might try to hedge by selling ringgit in the onshore market. A 2013 study of nine NDF markets by the Bank for International Settlements found that the offshore and onshore markets both influenced each other, except in Malaysia, where onshore followed off.

Malaysia's central bank has instructed onshore institutions not to take part in the NDF market or help others to do so. Foreign banks with operations in Malaysia seem to be deferring to the central bank's wishes, notes Stephen Innes of Oanda, a foreign-exchange broker, to preserve their good name in Malaysia. "They are not aggressively selling the ringgit right now."

But one reason the offshore market is so spiky is because trading is thin. That illiquidity may worsen if banks retreat. And if foreign investors cannot easily hedge their exposure to the ringgit, they will be less willing to buy ringgit assets. That might leave Malaysia with a weaker currency over the long term even if it is more stable from day to day. "No one from the banks is willing to discuss the ramifications," Mr Innes says. "I find that quite unique." Others may find it worrying. Silencing the markets is not the same as calming them. ■

India's cash crunch

Short-changed

A scarcity of legal tender puts the squeeze on India's economy

A NEW strain of trickle-down economics has been spawned by the decision, on November 8th, to withdraw the bulk of India's banknotes by the end of this year. As holders of now-useless 500-and 1,000-rupee ($15) notes rushed to deposit them or part-exchange them for new notes, an e-commerce site offered helpers, at 90 rupees an hour, to queue outside banks in order to save the well-off the bother.

Elsewhere, a chronic shortage of banknotes in a cash-dominated economy has left most trades depressed. Seven out of ten *kiranas* (family-owned grocers) have suffered a decline in business, according to a survey by Nielsen, a consultancy. Supply chains, in which wholesalers and truckers deal mostly in cash, have fractured. Some 20-40% less farm produce reached markets in the days after the reform. City folk admit to hoarding the 100-rupee note, the largest of the old notes to remain legal tender. Taxi drivers refuse to break the new 2,000-rupee note. Road-tolls have been suspended until at least November 24th, to prevent queues. Beggars have disappeared from parts of Delhi; no one has spare change.

India's prime minister, Narendra Modi, is gambling that this temporary pain will be worth it. His goal is to flush out "black money", stores of wealth that bypass the tax system, finance election campaigns and grease the wheels of high-level corruption. An enforced swap of high-value notes, say the reform's boosters, acts as a tax on holders of illicit wealth. The element of surprise is disruptive but without it, there would be time for black-money holders to launder their funds by purchasing gold, foreign currency or property. A tight deadline makes it hard for holders of large stashes of notes to swap or deposit them without alerting the tax authorities.

This swiftness comes with a cost. Aside from cases where hyperinflation has rendered a currency worthless, such swaps generally take place over long periods to avoid disrupting commerce. GDP growth might be as much as two percentage points lower this quarter and next before returning to normal as the money stock is replenished, reckons Pranjul Bhandari of HSBC, a bank. Much depends on how quickly new cash can be swapped for old. It has not been a smooth process so far. The Reserve Bank of India (RBI), which issues notes, waited for six days before setting up a task force to ensure ATMs could dispense the new 2,000-rupee note. Only a quarter of ATMs in four big cities were full on November 21st, according to Goldman Sachs.

Yet there are signs that the reform is nudging Indians out of cash and into bank deposits and plastic, where money can be tracked. In the fortnight after the announcement, bank deposits were up by 5.1trn rupees, thanks to an influx of old notes and restrictions on withdrawals of new ones. PayTM, a provider of digital wallets, reported a surge in transactions.

Despite the distress, and the raucous protests, the reform seems to have widespread support. Bashing the rich is popular even if the poor are inconvenienced. Some may also hope it will bring new state benefits for the poor and make housing more affordable. Indian real estate is so expensive in part because it is a store of illicit funds. In theory, whatever black money cannot be laundered will be worthless, yielding a gain for government's finances and perhaps ultimately for poorer Indians. But such a boost cannot be relied upon. The RBI has not yet formally said that old notes will be cancelled for good, says Ashish Gupta of Credit Suisse, and it may be loth to do so. No central bank likes to say it no longer stands behind the paper it issues. ■

A short, sharp liquidity shock

Free exchange | Trend growth

New techniques should broaden, not narrow, the discipline of economics

WHAT is the collective noun for a group of economists? Options include a gloom, a regression or even an assumption. In January, when PhD students jostle for jobs at the annual meeting of the American Economic Association, a "market" might seem the *mot juste*. Or perhaps, judging by the tendency of those writing economic papers to follow the latest fashion, a "herd" would be best. This year the hot technique is machine learning, using big data; Imran Rasul, an economics professor at University College, London, is expecting to read a pile of papers using this voguish technique.

Economists are prone to methodological crazes. Mr Rasul recalls past paper-piles using the regression-discontinuity technique, which compared similar people either side of a sharp cut-off to gauge a policy's effect. An analysis by *The Economist* of the key words in working-paper abstracts published by the National Bureau of Economic Research, a think-tank (see chart), shows tides of enthusiasm for laboratory experiments, randomised control trials (RCTs) and the difference-in-differences approach (ie, comparing trends over time between different groups).

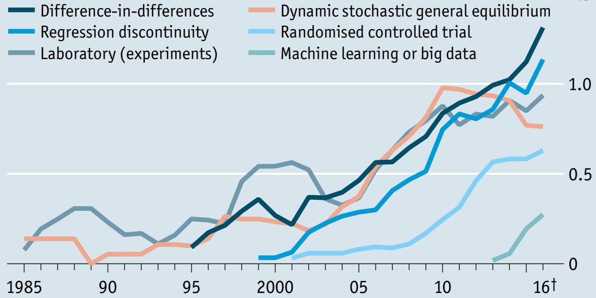
When a hot new tool arrives on the scene, it should extend the frontiers of economics and pull previously unanswerable questions within reach. What might seem faddish could in fact be economists piling in to help shed light on the discipline's darkest corners. Some economists, however, argue that new methods also bring new dangers; rather than pushing economics forward, crazes can lead it astray, especially in their infancy.

In 1976 James Heckman developed a simple way of correcting for the problem of a specific type of sample selection. For example, economists had difficulty estimating the effect of education on women's wages, because the ones who chose to work (for whom pay could be measured) were particularly likely to enjoy high returns. When Mr Heckman offered economists a simple way of correcting this bias, which involved accounting for the choice to enter work, it took the social sciences by storm. But its seductive simplicity led to its misuse.

A paper by Angus Deaton, a Nobel laureate and expert data digger, and Nancy Cartwright, an economist at Durham University, argues that randomised control trials, a current darling of the discipline, enjoy misplaced enthusiasm. RCTs involve randomly assigning a policy to some people and not to others, so that researchers can be sure that differences are caused by the policy. Analysis is a simple comparison of averages between the two. Mr Deaton and Ms Cartwright have a statistical gripe; they complain that researchers are not careful enough when calculating whether two results are significantly different from one another. As a consequence, they suspect that a sizeable portion of published results in development and health economics using RCTs are "unreliable".

Dedicated followers of fashion

Mentions in NBER working-paper abstracts, % of total papers*



Sources: NBER; *The Economist*

*Five-year moving average †To November

With time, economists should learn when to use their shiny new tools. But there is a deeper concern: that fashions and fads are distorting economics, by nudging the profession towards asking particular questions, and hiding bigger ones from view. Mr Deaton's and Ms Cartwright's fear is that RCTs yield results while appearing to sidestep theory, and that "without knowing why things happen and why people do things, we run the risk of worthless causal ('fairy story') theorising, and we have given up on one of the central tasks of economics." Another fundamental worry is that by offering alluringly simple ways of evaluating certain policies, economists lose sight of policy questions that are not easily testable using RCTs, such as the effects of institutions, monetary policy or social norms.

Elsewhere in economics one methodology has on occasion crowded others out. An excess of consensus among macroeconomists in the run-up to the financial crisis has haunted them. In August, Olivier Blanchard, a heavyweight macroeconomist, wrote a plea to colleagues to be less "imperialistic" about their use of dynamic stochastic general equilibrium models, adding that, for forecasting, their theoretical purity might be "more of a hindrance than a strength". He issued a reminder that "different model types are needed for different tasks."

Still crazy after all these years

Machine learning is still new enough for the backlash to be largely restricted to academic eye-rolling. But some familiar themes are emerging in this latest craze. In principle, these new techniques should protect economists from their own sloppy theorising. Before, economists would try to predict things using only a few inputs. With machine learning, the data speak for themselves; the machine learns which inputs generate the most accurate predictions.

This powerful method appears to have improved the accuracy of economists' predictions. For example, researchers have started to use big data to predict whether a criminal suspect is likely to come back to court for a trial, influencing bail decisions. But, as with RCTs, a powerful algorithm might seduce its users into ignoring underlying causal factors. In her new book, "Weapons of Math Destruction", Cathy O'Neil, a data scientist, points out that some factors, such as race or coming from a high-crime neighbourhood, might be excellent predictors of recidivism. But they could reflect racism in law enforcement or zero-tolerance "broken windows" policies that lead to high recorded crime rates in poor or minority neighbourhoods. If so, those predictions risk punishing people for factors beyond their control.

Mr Rasul is not very worried by the "little bit of overshooting" that excitement at new methods engenders. Over time, their merits and limitations are better appreciated and they join the toolkit alongside older methods. But the critics of faddishness have one thing right. Good economics is about asking the right questions. Of all the tools at the discipline's disposal, its practitioners' scepticism is the most timeless. ■

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Exoplanets

Portraits of worlds

Finding exoplanets has become routine. The next step is to try to take pictures of them—including, perhaps, those closest to Earth

IN THE quarter of a century since the first extrasolar planets were discovered, astronomers have turned up more than 3,500 others. They are a diverse bunch. Some are baking-hot gas giants that zoom around their host stars in days. Some are entirely covered by oceans dozens of kilometres deep. Some would tax even a science-fiction writer's imagination. One, 55 Cancri e, seems to have a graphite surface and a diamond mantle. At least, that is what astronomers think. They cannot be sure, because the two main ways exoplanets are detected—by measuring the wobble their gravity causes in their host stars, or by noting the slight decline in a star's brightness as a planet passes in front of it—yield little detail. Using them, astronomers can infer such basics as a planet's size, mass and orbit. Occasionally, they can interrogate starlight that has traversed a planet's atmosphere about the chemistry of its air. All else is informed conjecture.

What would help is the ability to take pictures of planets directly. Such images could let astronomers deduce a world's surface temperature, analyse what that surface is made from and even—if the world were close enough and the telescope powerful enough—get a rough idea of its geography. Gathering the light needed to create such images is hard. The first picture of an extrasolar world, 2M1207b, 170 light-years away, was snapped in 2004, but the intervening dozen years have seen only a score or so of others join it in the album. That should soon change, though, as new instruments both on the ground and in space add to the tally. And a few of the targets of these telescopes may be the sorts of planets that have the best chance of supporting life, namely Earth-sized worlds at the right distance from sun-like stars, in what are known as those stars' habitable zones—places where heat from the star might be expected to stop water freezing without actually boiling it.

Smile, please

Taking pictures of exoplanets is hard for two reasons. One is their distance. The other is that they are massively outshone by their host stars.

Interstellar distances do not just make objects faint. They also reduce the apparent gap between a planet and its host, so that it is hard to separate the two in a photograph. Such apparent gaps are measured in units called arc-seconds (an arc-second is a 3,600th of a degree). This is about the size of an American dime seen from four kilometres away. The exoplanet closest to Earth orbits Proxima Centauri, the sun's stellar neighbour. Yet despite its proximity (4.25 light-years) the angular gap between this planet and its star is a mere 0.38 arc-seconds, according to Beth Biller, an exoplanet specialist at the University of Edinburgh. Separating objects which appear this close together requires a pretty big telescope.

The second problem, glare, is best dealt with by inserting an opaque disc called a coronagraph into a telescope's optics. A coronagraph's purpose is to block light coming directly from a star while permitting any that is reflected from planets orbiting that star to shine through. This palaver is necessary because, as a common analogy puts it, photographing an exoplanet is like trying to take a picture, from thousands of kilometres away, of a firefly buzzing around a lighthouse. Seen from outside the solar system, Earth would appear to be a ten-billionth as bright as the sun.

Those exoplanets that have had their photographs taken so far are ones for which these problems are least troublesome—gigantic orbs (which thus reflect a lot of light) circling at great distances (maximising angular separation) from dim hosts (minimising glare). In addition, these early examples of planetary photography have usually involved young worlds that are still slightly aglow with the heat of their formation. Even then, serious hardware is required. For example, four giant planets circling a star called HR8799 were snapped between 2008 and 2010 by the Keck and Gemini telescopes on Hawaii (see picture overleaf). These instruments have primary mirrors that are, respectively, ten metres and 8.1 metres across. The good news for planet-snappers is that such giant telescopes are becoming more common, and that people are building special planet- ▸▸

Award. On October 23rd Natasha Loder, our health-care correspondent, was named Science Commentator of the Year in the 2016 Comment Awards, an annual set of prizes for British journalists.

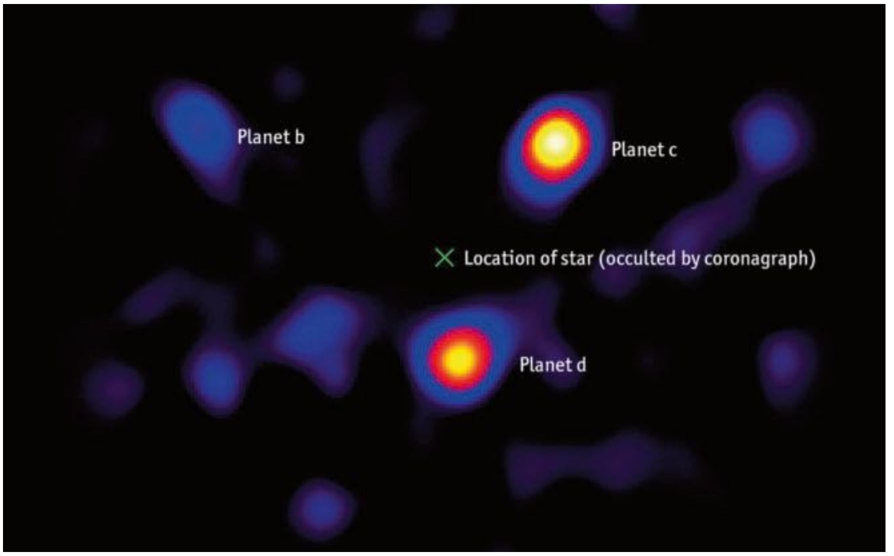
photographing cameras to fit on them.

At the moment, the three most capable are the Gemini Planet Imager, attached to the southern Gemini telescope, in Chile; the Spectro-Polarimetric High-Contrast Exoplanet Research Instrument on the Very Large Telescope, a European machine also in Chile; and the Subaru Coronagraphic Extreme Adaptive Optics Device on the Subaru telescope, a Japanese machine on Hawaii. All of those telescopes sport a mirror more than eight metres across, making them some of the biggest in the world, and their planet-photographing attachments are fitted with the most sophisticated coronagraphs available. The result is that the Subaru device, for example, can take pictures of giant planets that orbit their stars slightly closer in than Jupiter orbits the sun.

This improved sensitivity will let astronomers take pictures of many more worlds. The Gemini Planet Imager, for instance, is looking for planets around 600 promising stars. (Its first discovery was announced in August 2015.) But even these behemoths will still be limited to photographing gas giants. To take snaps of the next-smallest class of planets (so-called "ice giants" like Neptune and Uranus), and the class after that (large, rocky planets called "super-Earths" that have no analogue in the solar system), will require even more potent instruments.

These are coming. The European Extremely Large Telescope (ELT) is currently under construction in the Chilean mountains. Its 39.3 metre mirror will be nearly four times the diameter of the present record-holder, the Gran Telescopio Canarias, in the Canary Islands, which has a mirror 10.4 metres across. When it is finished, in 2024, the ELT should be sensitive enough to photograph Proxima Centauri's planet, as well as other rocky ones around nearby stars. A smaller instrument, with a 24.5 metre mirror, the Giant Magellan Telescope, should be finished in 2021. The Thirty Metre Telescope, planned for Hawaii, will, as its name suggests, fall somewhere between those two—though its construction has been halted by legal arguments.

For ground-based telescopes that may be the end of the line, says Matt Mountain, who is president of the Association of Universities for Research in Astronomy, and who oversaw the construction of the Gemini telescopes. The shifting currents of Earth's atmosphere (the reason stars seem to twinkle even to the naked eye) impose limits on how good they can ever be as planetary cameras. To get around those limits means going into space. Although it is not specifically designed for the job, the *James Webb* space telescope, which is scheduled for launch in 2018 and which boasts both a mirror 6.5 metres across and a reasonably capable coronagraph, should be able to snap pictures of some large, nearby worlds. It will be able to sniff the atmospheres of many more, analysing starlight that has passed through those atmospheres on its way to Earth. *WFIRST*, a space telescope due to launch in the mid-2020s, will have picture-taking capabilities of its own, and will serve to test the latest generation of coronagraphs.



Another solar system: HR8799 and three of its four planets

After that, astronomers who want to picture truly Earth-like worlds are pinning their hopes on a set of ambitious missions which, for now, exist only as proposal documents in NASA's in-tray. One of the most intriguing is the New Worlds Mission. This hopes to launch a giant occulter (in effect, an external coronagraph) that would fly in formation with an existing space telescope (probably the *James Webb*) to boost its exoplanet-imaging prowess.

Small is beautiful

There may, though, be an alternative to this big-machine approach. That is the belief of the members of a team of researchers led by Jon Morse, formerly director of astrophysics at NASA. Project Blue, as this team calls itself, hopes, using a mixture of private grants, taxpayers' money and donations from the public, to pay for a space telescope costing $50m (as opposed, for example, to the $9 billion budgeted for the *James Webb*) that would try to take pictures of any Earth-like exoplanets orbiting in the habitable zone of Alpha Centauri A—the closest sun-like star to Earth, and a big brother to Proxima Centauri.

Alpha Centauri is hotter than Proxima, which means its habitable zone is much further away. That, combined with its closeness, means Project Blue can get away with a mirror between 30 and 45cm across—the size of mirror an enthusiastic amateur might have in his telescope. What such an amateur would not have, though, is a computer-run "multi-star wavefront controlled" mirror. This will draw on a technology already fitted to ground-based telescopes, called adaptive optics, in which portions of the mirror are subtly deformed in order to sculpt incoming light.

In combination with a coronagraph the wavefront controller will, according to Supriya Chakrabarti of the University of Massachusetts, Lowell, let the telescope blot out the light not only of Alpha Centauri A, but also of Alpha Centauri B, a companion even closer to it than Proxima Centauri is. Moreover, the plan is to take thousands of pictures over the course of several years. By combining these and looking for persistent signals—particularly ones that appear to follow plausible orbits—computers should be able to pluck any planets from the noise.

If it works, Alpha Centauri A's closeness means Project Blue's telescope could reveal lots of information about any planets orbiting that star (and statistical analysis of known exoplanets suggests there will almost certainly be some). Examining the spectrum of light from them would reveal what their atmospheres and surfaces were made from, including any chemicals—such as oxygen and methane—that might suggest the presence of life. It might even be possible to detect vegetation, or its alien equivalent, directly. The length of a planet's day could be inferred by watching for regular changes in light as its revolution about its axis caused continents and seas to become alternately visible and invisible. Longer-term variations might reveal planetary seasons; shorter-term, more chaotic ones might be evidence of weather.

If they can raise the money in time, the Project Blue team hope to launch their telescope in 2019 or 2020. Being able to take a picture of a rocky planet around one of the sun's nearest neighbours would be an enormous scientific prize. If a habitable planet were found, it would be one of the biggest scientific discoveries of the century. Donors may think that worth a punt. ■

Reactionless motors

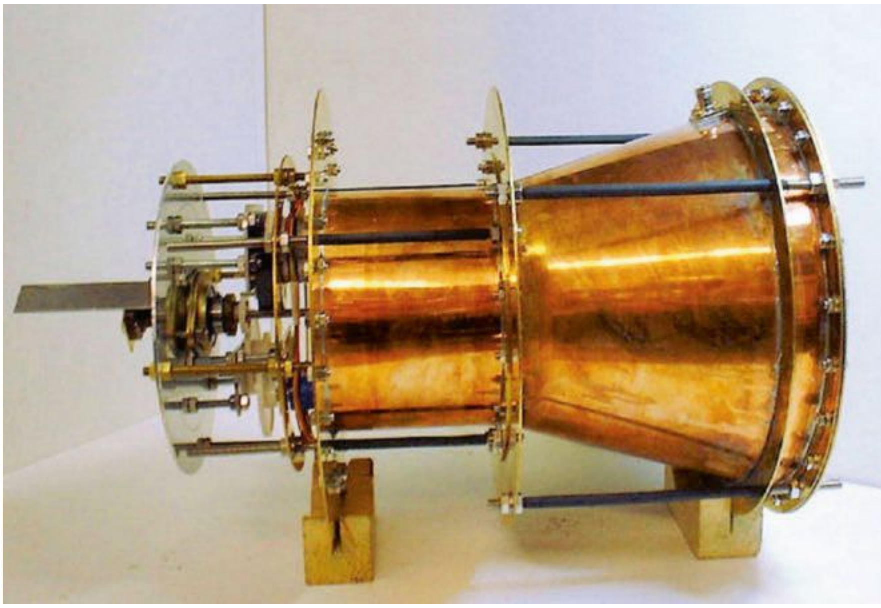
Ye cannae break the laws of physics

Or can ye?

ROCKETS are spectacular examples of Isaac Newton's third law of motion: that to every action there is an equal and opposite reaction. Throwing hot gas out of its engines at high speed (the action) thrusts a rocket off its launch pad and into space (the reaction). But having to carry the propellants needed to create the gas (the reaction mass) is a pain, for at any given moment during a flight the action has to propel not only the rocket itself, but also all of the remaining, unburnt propellant. Most of the effort expended in a rocket launch is therefore directed towards lifting propellant rather than payload. As a result, even the most modern rockets start off with a mass that is more than 90% propellant.

The fantasy of rocket scientists is therefore an engine that needs no propellant. And that is what Roger Shawyer, a British aerospace engineer, claims to have invented. In his view, his EMDrive (the "EM" stands for "electromagnetic") converts electrical energy straight into thrust, with no need for reaction mass. The only trouble is, that should be impossible.

An EMDrive (see picture) is a conical metal cavity into which microwaves are fed, and inside of which they bounce around. Electromagnetic radiation has no mass, but it does carry momentum (this is the principle by which solar sails work, using the pressure of sunlight to produce thrust). Dr Shawyer argues that the EMDrive's conical shape results in different levels of radiation pressure at each of the cavity's ends, and therefore a net thrust in the direction of the thin end. Every physicist who has studied the idea says this is impossible. Because nothing is emitted from an EMDrive, it cannot generate thrust, any more than the crew of a spaceship could fly to Mars by pushing on the walls. Dr Shawyer nevertheless says he can measure this apparently impossible thrust.


Any reaction?

Exotic claims of antigravity devices, perpetual-motion machines and the like are hardly unusual (*The Economist* once received detailed plans for a faster-than-light spaceship in the post). But the EMDrive stands out, for it transpires that Dr Shawyer is not the only person who has detected thrust coming from it. Harold White and his team at the Eagleworks laboratory in Houston, Texas, have done so too—and they are scientists employed by NASA, America's space agency. The Eagleworks, which is part of the Johnson Space Centre, is a place where the agency tests fringe ideas. And, as Dr White and his colleagues report in a paper just published in the *Journal of Propulsion and Power*, when they put an EMDrive that they had built themselves onto their test bench, they measured a small but persistent thrust.

So what is going on? The romantic explanation is that the EMDrive is a technological breakthrough which works by harnessing exotic new physics, and that by scaling it up people will be able to conquer the solar system. More likely, it is experimental error. Much has been made, among EMDrive fans, of the fact that Dr White's paper was peer-reviewed. Although that is important, peer review means only that the experiment was competently executed, not that its conclusions are true. Dr White and his team admit that they have not accounted for every possible source of error. The likeliest explanation is that some overlooked factor is producing the illusion of thrust when, in fact, there is none.

Just occasionally, such mysteries do lead to a revolution. Astronomers in the 19th century had difficulty explaining details of the trajectory of Mercury. To do so, it turned out, you had to throw away classical physics and replace it with the theory of relativity. More often, though, the status quo holds. In 2011 a respected physics laboratory in Italy reported curious results that seemed to show subatomic particles travelling faster than light. They turned out to be caused by faulty wiring in the experiment. And physicists were puzzled for decades by the fate of the *Pioneer* space probes, whose trajectories through the solar system were not quite what they should have been. Radiation pressure from their internal heat was eventually fingered as the culprit. In physics as in the rest of life, if it sounds too good to be true, it almost always is. ■

Air pollution

Blown away

Retired jet engines could help clear the smog that smothers big cities

TO LAND at Indira Gandhi Airport is to descend from clear skies to brown ones. Delhi's air is toxic. According to the World Health Organisation, India's capital has the most polluted atmosphere of all the world's big cities. The government is trying to introduce rules that will curb emissions—allowing private cars to be driven only on alternate days, for example, and enforcing better emissions standards for all vehicles. But implementing these ideas, even if that can be done successfully, will change things only slowly. A quick fix would help. And Moshe Alamaro, a researcher at the Massachusetts Institute of Technology, thinks he has one.

His idea is to take a jet engine, put it next to one of India's dirty coal-fired power plants, point its exhaust nozzle at the sky and then switch it on. His hope is that the jet's exhaust will disrupt a meteorological phenomenon known as "inversion", in which a layer of warm air settles over cooler air, trapping it, and that the rising stream of exhaust will carry off the tiny particles of matter that smog is composed of.

Inversion exacerbates air pollution in Delhi and in many other cities, from Los Angeles to Tehran. A particularly intense example caused the Great Smog of London in 1952, when four days of air pollution contributed to 12,000 deaths. Dr Alamaro ▸▸

thinks a jet engine could punch through the inversion layer to create a "virtual chimney" which would carry the trapped pollution above it, so that it could be dispersed in the wider atmosphere. He calculates that all the emissions from a gigawatt coal-fired power plant could be lifted away using a single engine with a nozzle speed of 460 metres a second. However, he has not calculated whether a jet engine could disrupt the inversion layer and allow the pollution to escape the city—so he is now going to test that hypothesis.

Within eight months, Dr Alamaro plans to put one of his updrafters next to a coal-fired power plant and monitor what happens using a fleet of drones. He is in discussions with Tata Group, a conglomerate with an electricity-generating arm, to run it next to one of the firm's power stations. Another good candidate would be a government-run plant at Badarpur, less than 50km from the middle of Delhi. According to the Centre for Science and the Environment, a research and lobbying group based in the Indian capital, Badarpur is one of the most polluting power plants in the country. Earlier this month the government shut it down for ten days as part of a set of emergency measures intended to curb a particularly intense bout of air pollution.

Dr Alamaro has already found some of the decommissioned jet engines he needs to build his first updrafter. Both the Indian and the American air forces have been forthcoming. The Indians have offered six retired engines for nothing and the Americans are in the process of approving a further four engines from the Boneyard, an aircraft-storage facility located on Davis-Monthan Air Force Base in Arizona. They are asking for just $5,000 per jet to cover the labour needed to prepare the engines, plus shipping.

Some meteorologists are sceptical. They suggest that the engines on offer will not have the oomph to push material through Delhi's inversion layer, especially during daylight hours, when the boundary between warm and cool air sits at an altitude of around a kilometre. They also say that Dr Alamaro's notion of a virtual chimney is too simple. Turbulence and friction will weaken the exhaust stream as it climbs. Moreover, even if the technique does work, using it to attack a citywide inversion layer would require so many jets and so much fuel as to be prohibitively expensive, says Alexander Baklanov, a researcher at the World Meteorological Organisation, in Geneva.

Dr Alamaro, naturally, disagrees—and if he can keep to his timetable it will not be long before it is clear who is right. Even if his ambitions for citywide arrays of virtual chimneys prove too ambitious, they may still work in some of the worst cases of pollution. Andreas Christen, who studies urban meteorology at the University of British Columbia, in Vancouver, notes that the direst episodes of pollution happen when air is cold—at night, for example. This is because the air contracts into a smaller volume at low temperatures, giving warm air above it room to expand downwards. That concentrates airborne gunk, but it also brings the inversion layer within closer range of Dr Alamaro's jets. As Dr Christen observes, some farmers in rich countries already use helicopters to disrupt inversion layers above their fields and thus protect their crops from frost. Dr Alamaro's jets may offer an alternative. ■

Scientific publishing

All together now

Why research papers have so many authors

ONE thing that determines how quickly a researcher climbs the academic ladder is his publication record. The quality of this clearly matters—but so does its quantity. A long list of papers attached to a job application tends to impress appointment committees, and the resulting pressure to churn out a steady stream of articles in peer-reviewed journals often leads to the splitting of results from a single study into several "minimum publishable units", to the unnecessary duplication of studies and to the favouring of work that is scientifically trivial but easy to publish.

There is another way to pad publication lists: co-authoring. Say you write one paper a year. If you team up with a colleague doing similar work and write two half-papers instead, both parties end up with their names on twice as many papers, but with no increase in workload. Find a third researcher to join in and you can get your name on three papers a year. And so on.

To investigate the matter, *The Economist* reviewed data on more than 34m research papers published between 1996 and 2015 in peer-reviewed journals and conference proceedings. These were drawn from Scopus, the world's biggest catalogue of abstracts and citations of papers, which is owned by RELX Group, a publisher and information company.

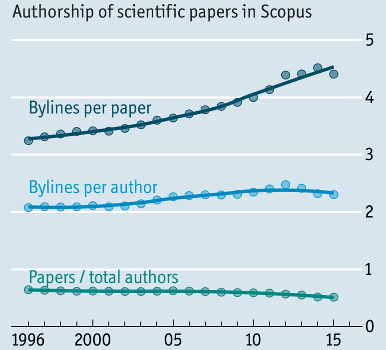
Over the period in question, the average number of authors per paper grew from 3.2 to 4.4. At the same time, the number of papers divided by the number of authors who published in a given year (essentially, the average author's overall paper-writing contribution) fell from 0.64 to 0.51. The boom in co-authorship more than compensated for the drop in individual productivity, so that the average researcher notched up a slightly higher number of papers for his curriculum vitae: 2.3 a year compared to 2.1 two decades earlier.

One particular trend behind these numbers is the rise of "guest authorship", in which a luminary, such as the director of a research centre, is tagged on as an author simply as a nod to his position or in the hope that this signals a study of high quality. That can lead to some researchers becoming improbably prolific. For example, between 2013 and 2015 the 100 most published authors in physics and astronomy from American research centres had an average of 311 papers each to their names. The corresponding figure for medicine, though lower, was still 180. Figures for British universities are more modest but similarly striking. The top century of physicists and astronomers averaged 280 papers each; the top century of doctors, 139 papers. Indeed, it is so easy to add a co-author that some have honoured their pets. Sir Andre Geim, who won the 2010 Nobel Prize in physics, listed H.A.M.S. ter Tisha as co-author of a paper he published in 2001 in *Physica B*, a peer-reviewed journal.

Another trend is that the meaning of authorship in massive science projects is getting fuzzier. Particle physics and genomics, both of which often involve huge transnational teams, are particularly guilty here. A paper on the Higgs boson published in 2015 in *Physical Review Letters* holds the record, with 5,154 co-authors (listed on 24 of the paper's 33 pages). It reported on the mass of the boson, a fundamental particle studied in experiments conducted in the giant—and heavily staffed—Large Hadron Collider near Geneva. A genomics paper on *Drosophila*, a much-studied fruitfly, also published in 2015, has 1,014 authors, most of them students who helped with various coding tasks. Such studies are paragons of scientific collaboration and the exact opposite of creating minimum publishable units. But they list as authors people who have contributed only marginally to the success of the project—roles that, in the past, were simply acknowledged in a thanks-to-all sentence but are now the bricks from which careers may be built. ■

Papered over

Authorship of scientific papers in Scopus



Source: Scopus

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India's diaspora

A model minority

How Indians triumphed in America

The Other One Percent: Indians in America. By Sanjoy Chakravorty, Devesh Kapur and Nirvikar Singh. *OUP USA; 355 pages; $34.95 and £22.99*

IN THE early 20th century just a few hundred people emigrated from India to America each year and there were only about 5,000 folk of Indian heritage living in the United States. That was more than enough for some xenophobes. A government commission in 1910 concluded that Indians were "the most undesirable of all Asiatics" and that the citizens of America's west coast were "unanimous in their desire for exclusion".

Today Indian-born Americans number 2m and they are probably the most successful minority group in the country. Compared with all other big foreign-born groups, they are younger, richer and more likely to be married and supremely well educated. On the west coast they are a mighty force in Silicon Valley; well-off Indians cluster around New York, too. "The Other One Percent" is the first major study of how this transformation happened. Filled with crunchy analysis, it exudes authority on a hugely neglected subject.

India's diaspora is vast, with 20m-30m people spread across the world from the Caribbean to Kenya. In colonial times many moved as labourers after Britain abolished slavery in 1833, to build the east African railway, for example. In the 1970s a second wave of workers went to the Gulf during the oil boom. Perhaps the least well known flow of Indians abroad is the one to America. It picked up after 1965, when American immigration rules were relaxed, and surged after 1990. Three-quarters of the Indian-born population in America today arrived in the last 25 years.

Like all immigrant groups, Indians have found niches in America's vast economy. Half of all motels are owned by Indians, mainly Gujaratis. Punjabis dominate the franchises for 7-Eleven stores and Subway sandwiches in Los Angeles. The surge in Indians moving to America is also intimately linked to the rise of the technology industry. In the 1980s India loosened its rules on private colleges, leading to a large expansion in the pool of engineering and science graduates. Fear of the "Y2K" bug in the late 1990s served as a catalyst for them to engage with the global economy, with armies of Indian engineers working remotely from the subcontinent, or travelling to America on workers' visas, to make sure computers did not fail at the stroke of midnight on December 31st 1999.

Today a quarter or more of the Indian-born workforce is employed in the tech industry. In Silicon Valley neighbourhoods such as Fremont and Cupertino, people of Indian origin make up a fifth of the population. Some 10-20% of all tech start-ups have Indian founders; Indians have ascended to the heights of the biggest firms, too. Satya Nadella, Microsoft's boss, was born in Hyderabad. Sundar Pichai, who runs Google, the main division of the firm Alphabet, hails from Tamil Nadu.

The authors of "The Other One Percent" have been careful to avoid the trap of explaining Indians' success in America through their particular culture. Instead they argue it is "at its core a selection story". Indians cannot walk across a border to America. Because of the filters of caste, class and a fiercely competitive education system, only those with above average financial and human capital get the chance to move to America. Most have travelled either as students or holders of H1-B working visas, which require a university degree, and then acquire residency. This visa system acts as a further filter.

Despite the light that the authors' data-driven approach casts on this little-known story, there are some disadvantages. One is that it leaves little scope for exploring the dark side of India's diaspora. Readers keen to peek at the underbelly should buy "The Billionaire's Apprentice", by Anita Raghavan, which was published in 2013. It is a brilliant account of the insider-trading ring that led to the downfall of Rajat Gupta, the former boss of McKinsey, a consulting firm. Fittingly he was pursued by a much-admired prosecutor of Indian descent.

But the authors do touch on the most fascinating question of all: how this gilded corner of the diaspora influences India itself. Diplomatic relations between the two giant democracies have long been testy. But in other realms the bond has grown closer. The stars at the pinnacle of American society are celebrated back in India alongside rather un-American figures such ▸▸

as spin-bowling masters and Bollywood maidens. The American-educated children of India's governing elite probably helped push India to open up its economy in 1991. The tens of billions of dollars of income earned in America by India's big technology firms is crucial for its balance of payments. And a new generation of entrepreneurs who have led a boom in e-commerce in India in the last five years are almost all American educated, or have worked for American technology firms.

If, under its new president, America clamps down on immigration, the mutually beneficial movement of Indians will surely slow—they were the largest group of new immigrants in 2014, exceeding even arrivals from China and Mexico. That will be a loss, both to America and to India. In this new era of populism, "The Other One Percent" is a rigorous, fact-based analysis of how cross-border flows of brainy and ambitious people make the world a better place. Politicians and policymakers in both America and in India should make sure they read it. ■

Publishing in India

Mythomania

How mythological fiction became India's "Game of Thrones"

WHEN the world's highest-earning novelist launches his new thriller in January, his co-author may not be familiar to Western fans. James Patterson, an American crime writer whose estimated annual revenues of $95m dwarf even those of Harry Potter's creator, J.K. Rowling, sometimes joins forces with local writers when he sends his investigators abroad. "Private Delhi" will be his second murder mystery with Ashwin Sanghi, a novelist from Mumbai who is far better known among Indian readers for his contribution to popular mythological fiction—one of the most remarkable, but overlooked, publishing stories of the past decade.

In the age of Patterson, Potter and "Game of Thrones", Indian authors have brought their own special flavours to the table: mass-market fiction based on reinterpretations of the two great Hindu epic narratives, the Ramayana and the Mahabharata. Canny authors enlist ancient fables of gods and heroes, of rival clans, gigantic battles, perilous quests and fearsome ordeals as a way of unlocking the crowd-pleasing genres of mystery, fantasy and historical romance.

These stories have helped transform publishing in a nation of 1.3bn people with improving literacy rates and—in contrast to long-term trends in the West—a growing appetite for the printed as well as the electronic book. Adult literacy rose from 65% to 74% between 2001 and 2011; the projection for 2020 is 90%. The annual value of the book market has swollen to an estimated $3.9bn, with 90,000 new titles added each year. Chiki Sarkar (who is married to a correspondent in our Delhi office) used to run Penguin Random House in India and has now founded her own company, Juggernaut Books. She believes that the establishment of book chains that emphasise promotions has meant big books are becoming bigger, just as they have in the West. "Into this landscape you've now got an old genre that has found new vitality," she adds.

The Ramayana and Mahabharata have long nourished Indian popular culture, whether through village storytelling, puppet-shows, television serials or Bollywood movies. Indian novelists writing in English used to be known abroad purely as a source of strenuous literary works; now they regularly produce gaudy blockbusters that marry these ancient tales with the latest trends in genre fiction.

The man credited with inaugurating this mythological revival is Ashok Banker, once better known as a literary novelist but who turned to mythological stories in 2003 with an eight-volume Ramayana series that began with "Prince of Ayodhya". Mr Banker is now writing a screenplay for Disney India, a two-part adaptation of a subsequent series, drawn from the Mahabharata. "Frankly, what is happening now is not something new. It is simply a continuation of an age-old tradition," Mr Sanghi says. "What makes it new is the language of choice—English."

Mr Sanghi believes that the main reason why India lacked home-grown English-language bestsellers for so long was the condescending attitude of Indian publishers. Only after the spectacular success of young writers such as Chetan Bhagat, whose 2004 novel, "Five Point Someone: What Not to Do at IIT", marked a turning-point, did things change. Dynamic Indian-based imprints began to exploit the newly discovered hunger for indigenous page-turners. The arrival of publishing multinationals, such as Random House and Hachette—which, from 2000, have been able to set up without an Indian partner—quickened the pace.

Some observers link the chart-topping mythology to the new assertiveness about Indian tradition that characterises the so-called "Hindutva" politics associated with the ruling BJP party and its leader, Narendra Modi, the prime minister. Christoph Senft, a specialist in modern Indian literature who teaches at Pune University in Maharashtra state, argues that a "search for internal homogeneity" has become the flipside of India's rapid push towards the global marketplace. "Mythological texts confirm the Hindu nationalists' wish to tell India's history as a history of Hinduism."

Some writers, however, mine the epics for stories and themes that have little to do with narrow chauvinism. Devdutt Pattanaik's "The Pregnant King" hunts down gender-fluid elements in the Mahabharata cycle. Chitra Banerjee Divakaruni's novel, ▸▸

A never-ending procession of stories

"The Palace of Illusions", tells that epic's core plot of dynastic conflict from the feminist perspective of the resilient, much-married heroine, Draupadi. Mr Banker, the godfather of the mythological-literature boom, has always scorned the politics of caste or creed, and voices pride in his mixed, part-Christian background. Amish Tripathi, author of the "Shiva Trilogy" of racy potboilers, calls himself a "religious liberal" and uses only his first name on book jackets to avoid the upper-caste connotations of his surname.

The vast bulk of readers turn to these pages packed with divinities and demons for excitement and distraction rather than religious instruction. As Mr Sanghi says: "I have always maintained that my primary goal is to entertain, not educate or enlighten. If the latter two objectives happen along the way, that's a bonus."

Paradoxically, this reclaiming of traditional lore has also helped bring Indian publishing into line with international norms. For all their deep roots in native soil, myth-fuelled bestsellers fit snugly into a global entertainment market that is often driven by story-cycles such as "Lord of the Rings" or "Game of Thrones". Ms Sarkar notes that the Indian bestseller list now looks more and more like mass-market fiction lists in Britain and America.

In common with several of his peers, Mr Sanghi started out in business before switching to writing novels with titles like "The Krishna Key". He holds an MBA from Yale, and initially joined his family firm in Mumbai. Mr Tripathi, whose reported million-dollar deal for South Asian rights to a series of Ramayana novels made global headlines in 2013, worked in banking and insurance before he became a writer. Mr Pattanaik qualified as a physician. One of the most successful women authors in a now-crowded field, Krishna Udayasankar, whose "Aryavarta Chronicles" refashion the Mahabharata, still lectures in management in Singapore.

Why should India's young professional dynamos turn with such relish to the distant storytelling past? Mr Sanghi argues that this group grasps the tools of "effective communication" but "does not carry the burden of a literary legacy". Unlike literary-fiction writers, they feel "free to experiment". Moreover, they know how to sell and are not afraid to involve themselves in marketing and distribution. Mr Tripathi's "Shiva Trilogy" was initially published as a digital download by his literary agent after it received more than 20 rejections from publishers. He has promoted his books on a variety of platforms, including YouTube and even at cricket matches of the Indian Premier League; since 2010 "Shiva" has sold more than 2.5m copies. Each Indian generation folds myth into modernity. As Ms Sarkar observes: "The epics have always been in fashion." ■

Contemporary art in China

City supreme

SHANGHAI

Is it China's new cultural capital?

EARLIER this month, two influential art curators threw a memorable party in Shanghai. The hosts—Linyao Kiki Liu, director of Si Shang Art Museum in Beijing, and Klaus Biesenbach, head of MOMA PS1, a well-known space affiliated with the Museum of Modern Art in New York—picked an unusual venue for the revelries: a renovated underground bomb shelter. Dark and smoky, it is unapologetic in its cursory approach to decor. Though it is usually a sanctum for the kind of Shanghai clubber for whom expensive booths for playing dice are a waste of dance floor, that night it was filled mostly with an out-of-town crowd that had flown in to celebrate two concurrent art fairs, as well as the return of the city's biennale. Shanghai, hip and hopping, seemed determined to present itself as a new centre of the art world.

Chinese contemporary art was actually born in Beijing. In 1979, soon after the country began rolling out Deng Xiaoping's economic reforms, a small group of artists mounted an unofficial exhibition on the park railings directly opposite the National Art Museum of China. The show lasted just two days before being shut down, but the seed for China's grass roots arts movement and spirit of collectivism was sown. A decade later, a few collectors were buying Chinese art. By the early 2000s the 798 arts district in the north-east of the city was becoming a vital destination for international dealers and curators. Now Shanghai is competing with Beijing to become China's cultural capital.

Shanghai's initial embrace of art was restrained. Beginning in the early 2000s, a few local galleries supported a scattering of artists. There were no more than a handful of museums. The prospect of hosting Expo 2010 helped motivate Shanghai's local government to encourage property developers to launch an ambitious urban-regeneration programme that would reframe the city as a cultural hub. At the heart of this renewal was West Bund, a 9.4km tract of Shanghai riverside, whose old industrial buildings and former airport were to be repurposed under the manifesto "Culture First, Industry Oriented".

The same year that Expo 2010 opened, the central government announced that it would build 3,500 new museums across the country within five years. It exceeded that figure three years early, in 2012. The call to action stimulated property developers to tag museums on to many of their projects in return for tax benefits and to curry favour with local authorities. West Bund was one of the most important beneficiaries of this policy.

In 2014 two landmark contemporary-art museums opened there. The Long Museum was the second outpost for the city's most prominent collectors, Liu Yiqian and his wife, Wang Wei. (The couple recently turned heads when they spent $170.4m at auction for a famous nude by Amedeo Modigliani, an Italian modernist.) Later in 2014 Budi Tek, a Chinese-Indonesian collector, launched his similarly large-scale Yuz Museum farther along the river. The same year also saw the introduction of Le Freeport West Bund, a bonded warehouse built to help the tax-free import, export and storage of artworks. It allows collectors to sidestep the 17% value-added tax imposed on art and the customs duty on works brought into the country. A game-changer for freeing up the movement of artworks, it is a prime example of the city's market-friendliness. Next year, two new museums will open in the district.

Over the past fortnight, Shanghai has attracted international art enthusiasts as never before. The smaller and more refined of the two art fairs was West Bund Art & Design. Its larger and only slightly longer-standing counterpart, ART021, took place in the grand, neoclassical Shanghai Exhibition Centre. Dwarfing both fairs is the Shanghai Biennale. Now in its 11th incarnation, it comprises a five-month-long exhibition and programme of performances and lectures.

The influx of collectors triggered by this triptych of events presented an important opportunity for galleries to hold exhibitions, unveil new spaces and host lavish soirées. Much of the activity took place in the newest art facilities—West Bund and the Power Station of Art (pictured).

All the glamour, though, cannot mask the concern felt by some artists and gallerists in Shanghai. Does projecting the city as such a high-end, resolutely outward-looking hub risk endangering some of other important corners of the city? In contemporary China there is little room for sentiment. Rapid gentrification is already forcing many small businesses to pull down the shutters, especially the humbler ventures that have long lent the city its richness—the family-run noodle joints, the bicycle-repair shops, and indeed, the venue of this month's big art party, Shelter, which is due to close at the end of this year after the Culture Bureau refused to renew its lease.

This upgrading of the city is already affecting the arts sector. Rising rents—a direct outcome of urban redevelopment—have made the production of art in Shanghai difficult, forcing artists to the city's fringes, and beyond. It risks crushing the kind of grass roots, artist-led initiatives on which so much of China's contemporary art was founded. The shift also affects galleries. Three of the city's most important names—MadeIn Gallery, Aike Dellarco and ShanghART—have relocated this year from Shanghai's original art hub, M50, to West Bund. Their departure will mean fewer visitors to M50's remaining lower-tier, entry-level galleries for whom a move to West Bund is out of the question. If M50 stumbles, that may affect new artists seeking representation in the city and younger, would-be collectors who want more affordable art than that shown at West Bund.

The cultural transformation of Shanghai has been astonishing. But it risks threatening the kind of complex, nuanced and sustainable engagement that a lively arts sector needs. If local government can encourage affordable spaces for young artists and help promote a climate in which artists and art professionals can thrive, then this most dynamic of cities might truly have it all. ■

Johnson | You tell me that it's evolution?

Scientists have reached no consensus on the origins of language

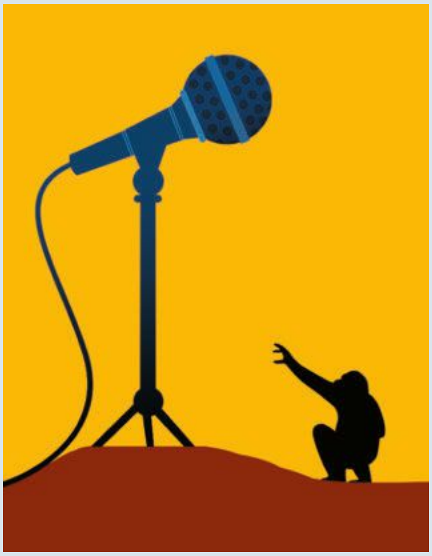
IN 1866, the founding statutes of the new Linguistic Society of Paris included this curious ban: "The Society will accept no communication concerning either the origin of language or the creation of a universal language." Darwin had published "On the Origin of Species" just seven years earlier, and he was intrigued by the parallels between linguistic and physical evolution. The society, with Catholic leanings, wanted none of it.

For more than a century afterwards, little was learned about the evolution of language—even though evolution had become the standard explanation for nearly all biological phenomena, whether physical or behavioural.

Today, the debate is lively. But there is still no consensus on how, when or why language evolved. There is hardly even the barest agreement that it evolved at all, in the sense of having been the specific product of gradual natural selection.

One figure who initially also kept mum on this subject was Noam Chomsky. For decades the towering figure of modern linguistics refused to be drawn into theorising about how language arose, arguing that although it must have arisen by evolution in some broad sense, it was impossible to know much in detail.

Speech leaves no fossils. Palaeoanthropologists know when the human brain began to grow to its unusually large size, but not when or why *homo sapiens* started putting that big brain to linguistic use. Stephen Jay Gould, an evolutionary biologist who was much loved for his popular writings, stepped into the debate by calling language a "spandrel". He borrowed the term from architecture, where a spandrel is the space between two arches which, over time, came to be decorated as features in their own right. In much the same way, Gould thought, big brains and increased intelligence were the original feature. The ability to turn that feature to complex and abstract communication was a spandrel.



In 1990 Steven Pinker and Paul Bloom, both then at MIT, published an article making a surprisingly controversial case. In their view, language had of course evolved in a typically Darwinian fashion: slowly, first as a result of random genetic mutation, but gradually giving early humans a survival advantage. That advantage was that each new human need not learn valuable information by direct experience, but can learn it from those who had come before: eat this, not that; this animal is dangerous; here's how to make an axe. While no one can say what the stages between basic cries and intricate modern syntax were, Messrs Pinker and Bloom were confident in positing a gradual unfolding.

Mr Chomsky later came to an unusual and different solution: that a single mutation in a single human gave that human an ability called "Merge". This ability was not for communication, but for thought: it allowed simpler thoughts to be combined into larger and more complex ones, and that this complex thought was the real survival advantage. The truly human bit of language—the ability to nest small units (words and phrases) inside larger ones (phrases and clauses and sentences) is, in this view, a useful by-product of "Merge". Though they are not Mr Chomsky's terms, you could call speech the spandrel, while thinking is the original arch.

One fruitful avenue of research is what elements of language are shared by humankind's animal cousins. Birds can use a small number of units to make an infinite series of different calls—as humans do with words. Chimps and other apes can learn hundreds of hand signs, and even combine them in crude but creative ways. Michael Corballis, a psychologist at the University of Auckland, thinks that gesture was crucial to the rise of complex language, a theory he expands in "The Truth about Language", to be published next year. Sign languages have all of the complexity of spoken ones, and deaf children even "babble" with their hands just as hearing children do with their mouths.

That so many great minds, including household names like Pinker, Chomsky and Gould, give such wildly different accounts, could be seen as a scientific failure. Or it can be taken as a charming reminder that even if science has left creation myths and just-so stories behind in the past, some problems—like consciousness, as well as language—remain hard to solve precisely because they are humankind's most human traits. Nobody ever said that studying the fascinating but flawed human mind with that very same mind should be easy.

Economic data

% change on year ago

	Gross domestic product			Industrial production	Consumer prices		Unemployment	Current-account balance		Budget balance	Interest rates, %	Currency units, per $	
	latest	qtr*	2016†	latest	latest	2016†	rate, %	latest 12 months, $bn	% of GDP 2016†	% of GDP 2016†	10-year gov't bonds, latest	Nov 23rd	year ago
United States	+1.5 Q3	+2.9	+1.5	-0.9 Oct	+1.6 Oct	+1.3	4.9 Oct	-488.2 Q2	-2.6	-3.2	2.29	-	-
China	+6.7 Q3	+7.4	+6.7	+6.1 Oct	+2.1 Oct	+2.0	4.0 Q3§	+266.6 Q3	+2.7	-3.8	2.67§§	6.89	6.39
Japan	+0.9 Q3	+2.2	+0.6	+1.5 Sep	-0.5 Sep	-0.2	3.0 Sep	+179.4 Sep	+3.6	-5.1	0.03	113	123
Britain	+2.3 Q3	+2.0	+2.0	+0.3 Sep	+0.9 Oct	+0.6	4.8 Aug††	-161.2 Q2	-5.7	-3.9	1.46	0.81	0.66
Canada	+0.9 Q2	-1.6	+1.2	-0.1 Aug	+1.5 Oct	+1.6	7.0 Oct	-51.1 Q2	-3.4	-2.7	1.54	1.35	1.34
Euro area	+1.6 Q3	+1.4	+1.5	+1.2 Sep	+0.5 Oct	+0.2	10.0 Sep	+376.3 Sep	+3.2	-1.7	0.26	0.95	0.94
Austria	+1.2 Q2	-0.9	+1.3	+2.3 Aug	+1.3 Oct	+0.9	6.3 Sep	+8.2 Q2	+2.6	-1.4	0.50	0.95	0.94
Belgium	+1.3 Q3	+0.8	+1.3	+1.0 Aug	+1.8 Oct	+1.8	8.0 Sep	+4.8 Jun	+1.2	-2.8	0.78	0.95	0.94
France	+1.1 Q3	+0.9	+1.3	-1.1 Sep	+0.4 Oct	+0.3	10.2 Sep	-34.1 Sep‡	-0.6	-3.3	0.71	0.95	0.94
Germany	+1.7 Q3	+0.8	+1.7	+1.1 Sep	+0.8 Oct	+0.4	6.0 Oct	+300.3 Sep	+8.6	+1.1	0.26	0.95	0.94
Greece	+1.2 Q3	+2.1	+0.2	+0.1 Sep	-0.5 Oct	nil	23.4 Aug	-0.2 Sep	+0.1	-5.1	6.92	0.95	0.94
Italy	+0.9 Q3	+1.3	+0.8	+1.8 Sep	-0.2 Oct	nil	11.7 Sep	+47.8 Sep	+2.4	-2.6	2.13	0.95	0.94
Netherlands	+2.4 Q3	+3.0	+1.6	+2.4 Sep	+0.4 Oct	+0.2	6.8 Oct	+59.7 Q2	+8.5	-1.2	0.39	0.95	0.94
Spain	+3.2 Q3	+2.8	+3.1	+1.2 Sep	+0.7 Oct	-0.4	19.3 Sep	+23.4 Aug	+1.4	-4.6	1.53	0.95	0.94
Czech Republic	+3.6 Q2	+1.2	+2.4	+2.7 Sep	+0.8 Oct	+0.5	5.0 Oct§	+3.7 Q2	+1.5	nil	0.56	25.7	25.4
Denmark	+0.8 Q2	+0.8	+1.0	-4.6 Sep	+0.3 Oct	+0.3	4.2 Sep	+23.6 Sep	+7.3	-1.0	0.42	7.06	7.03
Norway	-0.9 Q3	-1.9	+0.7	-13.7 Sep	+3.7 Oct	+3.5	4.8 Sep‡‡	+23.6 Q2	+4.9	+3.0	1.64	8.62	8.66
Poland	+3.0 Q2	+0.8	+3.0	-1.3 Oct	-0.2 Oct	-0.8	8.2 Oct§	-3.1 Sep	-0.4	-2.7	3.65	4.20	4.00
Russia	-0.4 Q3	na	-0.8	-0.3 Oct	+6.1 Oct	+7.0	5.4 Oct§	+30.2 Q3	+2.7	-3.7	8.84	64.7	65.6
Sweden	+3.4 Q2	+2.0	+3.2	+1.5 Sep	+1.2 Oct	+1.0	6.4 Oct§	+25.4 Q2	+5.0	-0.3	0.48	9.29	8.73
Switzerland	+2.0 Q2	+2.5	+1.4	-1.2 Q2	-0.2 Oct	-0.4	3.3 Oct	+66.1 Q2	+8.9	+0.2	-0.15	1.02	1.02
Turkey	+3.1 Q2	na	+3.1	-4.1 Sep	+7.2 Oct	+7.9	11.3 Aug§	-32.4 Sep	-4.8	-1.8	11.25	3.41	2.85
Australia	+3.3 Q2	+2.1	+2.8	+3.7 Q2	+1.3 Q3	+1.3	5.6 Oct	-52.8 Q2	-3.7	-2.1	2.65	1.35	1.39
Hong Kong	+1.9 Q3	+2.5	+1.6	-0.4 Q2	+1.2 Oct	+2.7	3.4 Oct‡‡	+13.6 Q2	+3.0	+0.1	1.38	7.76	7.75
India	+7.1 Q2	+5.5	+7.6	+0.7 Sep	+4.2 Oct	+5.0	5.0 2015	-16.2 Q2	-0.9	-3.8	6.28	68.5	66.5
Indonesia	+5.0 Q3	na	+5.0	+0.5 Sep	+3.3 Oct	+3.6	5.6 Q3§	-19.2 Q3	-2.2	-2.6	8.00	13,483	13,723
Malaysia	+4.3 Q3	na	+4.3	+3.2 Sep	+1.5 Sep	+1.9	3.5 Sep§	+5.6 Q3	+1.0	-3.4	4.31	4.44	4.30
Pakistan	+5.7 2016**	na	+5.7	+1.5 Aug	+4.2 Oct	+3.9	5.9 2015	-4.1 Q3	-0.9	-4.6	8.03†††	105	105
Philippines	+7.1 Q3	+4.9	+6.4	+9.9 Sep	+2.3 Oct	+1.7	5.4 Q3§	+3.2 Jun	+0.7	-1.0	4.54	49.9	47.2
Singapore	+1.1 Q3	-2.0	+1.0	+6.7 Sep	-0.1 Oct	-0.6	2.1 Q3	+63.0 Q3	+19.2	+0.7	2.31	1.43	1.42
South Korea	+2.7 Q3	+2.8	+2.7	-2.0 Sep	+1.3 Oct	+1.0	3.4 Oct§	+98.5 Sep	+7.2	-1.3	2.14	1,176	1,158
Taiwan	+2.1 Q3	+4.5	+1.0	+3.7 Oct	+1.7 Oct	+1.3	3.9 Oct	+74.7 Q3	+13.7	-0.5	1.30	31.9	32.6
Thailand	+3.2 Q3	+2.2	+3.0	+0.6 Sep	+0.3 Oct	+0.2	0.9 Sep§	+47.4 Q3	+5.9	-2.5	2.46	35.6	35.9
Argentina	-3.4 Q2	-8.0	-1.7	-2.5 Oct	— ***	—	9.3 Q2§	-15.4 Q2	-2.4	-5.0	na	15.5	9.67
Brazil	-3.8 Q2	-2.3	-3.2	-4.9 Sep	+7.9 Oct	+8.2	11.8 Sep§	-22.3 Oct	-1.1	-6.4	11.84	3.42	3.72
Chile	+1.6 Q3	+2.5	+1.8	-0.2 Sep	+2.8 Oct	+3.8	6.8 Sep§‡‡	-4.8 Q3	-1.9	-2.7	4.58	681	714
Colombia	+2.0 Q2	+0.8	+2.0	+4.0 Sep	+6.5 Oct	+7.6	8.5 Sep§	-15.7 Q2	-5.1	-3.7	7.50	3,198	3,087
Mexico	+2.0 Q3	+4.0	+2.1	-1.3 Sep	+3.1 Oct	+2.9	3.9 Sep	-30.9 Q2	-2.9	-3.0	7.46	20.7	16.5
Venezuela	-8.8 Q4~	-6.2	-13.5	na	na	+423	7.3 Apr§	-17.8 Q3~	-3.0	-24.4	10.57	10.0	6.31
Egypt	+6.7 Q1	na	+4.4	-11.7 Sep	+13.6 Oct	+13.1	12.6 Q3§	-18.7 Q2	-6.8	-11.5	na	17.5	7.84
Israel	+5.0 Q3	+3.2	+3.2	+5.4 Aug	-0.3 Oct	-0.5	4.5 Oct	+12.1 Q2	+2.9	-2.4	2.18	3.88	3.88
Saudi Arabia	+3.5 2015	na	+1.1	na	+2.6 Oct	+3.8	5.6 2015	-61.5 Q2	-5.6	-11.7	na	3.75	3.75
South Africa	+0.6 Q2	+3.3	+0.4	-0.1 Sep	+6.4 Oct	+6.1	27.1 Q3§	-12.9 Q2	-4.1	-3.4	9.00	14.3	14.1

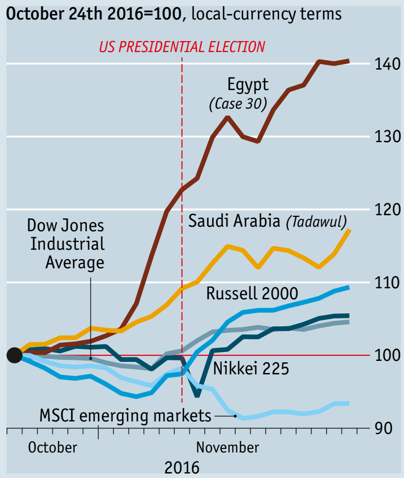
Source: Haver Analytics. *% change on previous quarter, annual rate. †*The Economist* poll or Economist Intelligence Unit estimate/forecast. §Not seasonally adjusted. ‡New series. ~2014 **Year ending June. ††Latest 3 months. ‡‡3-month moving average. §§5-year yield. ***Official number not yet proved to be reliable; The State Street PriceStats Inflation Index, Sept 35.92%; year ago 26.47% †††Dollar-denominated bonds.

Markets

	Index Nov 23rd	% change on: one week	Dec 31st 2015: in local currency	Dec 31st 2015: in $ terms
United States (DJIA)	19,083.2	+1.1	+9.5	+9.5
China (SSEA)	3,393.7	+1.1	-8.4	-13.7
Japan (Nikkei 225)	18,162.9	+1.7	-4.6	+1.6
Britain (FTSE 100)	6,817.7	+1.0	+9.2	-8.1
Canada (S&P TSX)	15,080.9	+2.4	+15.9	+19.3
Euro area (FTSE Euro 100)	1,028.0	+0.2	-6.1	-8.9
Euro area (EURO STOXX 50)	3,032.1	+0.2	-7.2	-10.0
Austria (ATX)	2,514.3	+0.7	+4.9	+1.7
Belgium (Bel 20)	3,467.9	nil	-6.3	-9.1
France (CAC 40)	4,529.2	+0.6	-2.3	-5.3
Germany (DAX)*	10,662.4	nil	-0.7	-3.8
Greece (Athex Comp)	632.5	+6.8	+0.2	-2.9
Italy (FTSE/MIB)	16,532.3	-0.2	-22.8	-25.2
Netherlands (AEX)	456.4	+1.5	+3.3	+0.2
Spain (Madrid SE)	869.3	-0.1	-9.9	-12.7
Czech Republic (PX)	888.7	-0.1	-7.1	-9.9
Denmark (OMXCB)	739.9	-0.5	-18.4	-20.6
Hungary (BUX)	30,156.3	+0.6	+26.1	+24.7
Norway (OSEAX)	725.9	+2.1	+11.9	+14.8
Poland (WIG)	48,540.7	+1.9	+4.5	-1.8
Russia (RTS, $ terms)	1,017.0	+2.8	+19.0	+34.3
Sweden (OMXS30)	1,482.6	+1.7	+2.5	-7.0
Switzerland (SMI)	7,752.2	-2.0	-12.1	-13.5
Turkey (BIST)	75,036.9	+0.4	+4.6	-10.6
Australia (All Ord.)	5,549.9	+2.8	+3.8	+5.3
Hong Kong (Hang Seng)	22,676.7	+1.8	+3.5	+3.4
India (BSE)	26,051.8	-0.9	-0.3	-3.7
Indonesia (JSX)	5,212.0	+0.5	+13.5	+16.0
Malaysia (KLSE)	1,630.4	+0.2	-3.7	-6.9
Pakistan (KSE)	42,901.0	+1.2	+30.7	+30.6
Singapore (STI)	2,839.7	+1.6	-1.5	-2.6
South Korea (KOSPI)	1,988.0	+0.4	+1.4	+1.0
Taiwan (TWI)	9,178.2	+2.4	+10.1	+13.5
Thailand (SET)	1,496.4	+1.5	+16.2	+17.5
Argentina (MERV)	17,366.5	+5.1	+48.7	+24.2
Brazil (BVSP)	61,985.9	+2.0	+43.0	+65.5
Chile (IGPA)	21,067.3	+0.7	+16.1	+20.8
Colombia (IGBC)	9,717.9	+0.8	+13.7	+12.9
Mexico (IPC)	45,184.1	+0.6	+5.1	-12.4
Venezuela (IBC)	25,509.7	-3.2	+74.9	na
Egypt (Case 30)	11,550.3	+5.0	+64.9	-26.4
Israel (TA-100)	1,265.9	+1.2	-3.7	-3.4
Saudi Arabia (Tadawul)	6,796.1	+2.2	-1.7	-1.6
South Africa (JSE AS)	50,616.4	+1.2	-0.2	+8.5

Stockmarkets

American shares have enjoyed a post-election rally, buoyed by speculation that Donald Trump will cut taxes, increase infrastructure spending and reduce regulation. The Dow Jones Industrial Average has risen by 4% since November 8th; the Russell 2000, an index of American small-cap stocks, has soared by 12%. A strong dollar has also buoyed Japanese markets: a weaker yen improves the earnings outlook for exporters. Although emerging-market stocks have suffered since the election, Egypt has bucked the trend. Since the government floated the pound at the start of the month there has been a surge in foreign investment. Saudi Arabian stocks bounced after the government sold $17.5bn of bonds in October.



Source: Thomson Reuters

Other markets

	Index Nov 23rd	% change on: one week	Dec 31st 2015: in local currency	Dec 31st 2015: in $ terms
United States (S&P 500)	2,204.7	+1.3	+7.9	+7.9
United States (NAScomp)	5,380.7	+1.6	+7.5	+7.5
China (SSEB, $ terms)	354.0	-0.3	-11.9	-17.0
Japan (Topix)	1,447.5	+1.8	-6.4	-0.3
Europe (FTSEurofirst 300)	1,344.2	+0.6	-6.5	-9.3
World, dev'd (MSCI)	1,709.7	+0.7	+2.8	+2.8
Emerging markets (MSCI)	855.9	+1.0	+7.8	+7.8
World, all (MSCI)	412.6	+0.7	+3.3	+3.3
World bonds (Citigroup)	886.8	-1.6	+1.9	+1.9
EMBI+ (JPMorgan)	761.7	-0.7	+8.1	+8.1
Hedge funds (HFRX)	1,189.8§	+0.3	+1.3	+1.3
Volatility, US (VIX)	12.4	+13.7	+18.2	(levels)
CDSs, Eur (iTRAXX)†	81.8	+3.4	+6.1	+2.9
CDSs, N Am (CDX)†	73.9	-1.8	-16.3	-16.3
Carbon trading (EU ETS) €	5.4	-8.6	-35.0	-37.0

Sources: Markit; Thomson Reuters. *Total return index.
†Credit-default-swap spreads, basis points. §Nov 22nd.

Indicators for more countries and additional series, go to: **Economist.com/indicators**

The Economist commodity-price index

2005=100

	Nov 15th	Nov 22nd*	% change on: one month	one year
Dollar Index				
All Items	140.0	143.5	+4.0	+14.4
Food	153.9	157.3	+0.1	+5.6
Industrials				
All	125.6	129.1	+9.5	+27.8
Nfa†	128.4	133.5	+5.3	+24.2
Metals	124.4	127.2	+11.5	+29.4
Sterling Index				
All items	205.6	210.0	+1.5	+38.7
Euro Index				
All items	162.3	168.5	+6.7	+14.9
Gold				
$ per oz	1,225.3	1,209.7	-4.9	+12.5
West Texas Intermediate				
$ per barrel	45.8	46.7	-5.7	+12.9

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 wedding house

Jia Jinglong, protester against forced expropriation, was executed on November 15th, aged 30

MAY 25th was an auspicious day for Jia Jinglong. It was his birthday by the lunar calendar, and in 2013 it was also the date of his forthcoming wedding to Li Lanlan. They had been going out for four years, a long time; but he was a shy boy, who had not wanted to go to college and didn't read or write much, and who would blush whenever he spoke to a girl.

The wedding was to happen in his family house in North Gaoying village in Hebei province, near Beijing. "Village" no longer seemed the right word; the small houses were being rapidly swallowed up by the city of Shijiangzhuang, whose towers rose up to the sky at the end of the village streets, while the thump of pile-driving drowned out the birds. Nonetheless Mr Jia loved his spacious house. He and his father had built it only six years before; it was full of windows, not all of which looked out on the encroaching cranes. It had three storeys. His parents lived on the ground floor; his two Tibetan mastiffs were on the top; and the second storey, his part, was the wedding house. It was already filled with more than 100 plants, as well as bundles of straw which kept him, and them, warm. Around the village he was the number-one guy for plants, he said. He grew begonias, aloe vera and every kind of cactus: ball cactus, crab cactus, lithops. Sometimes he gave them away to neighbours. "Anybody's kid who has an itchy neck knows to come to me for cactus," he told the court before his sentencing. By then, however, the judges had stopped listening.

To make his house ready for the wedding, he went to endless trouble. He changed his job at the pharmaceutical factory from the day to the night shift, so that he could spend the days refurbishing. On his knees, with hands callused from hard work, he carefully wiped out dust with a damp rag from cracks in the floors. After repainting he bought new furniture and hung up red decorations, the colour of Chinese weddings. Most of them he had made himself (he liked to sew, especially cross-stitch). Pride of place went to a framed red-backed collage of 0.01yuan coins, collected for years, arranged to form the characters "I love my home."

Men in black sedans

He knew that a shadow hung over it. In 2010 his father, Jia Tongqing, had signed a demolition order. It had been forced out of him by local party officials; if he didn't sign, Tongqing was told, his aged mother's request for a pension would be rejected. So it was done, and his parents had moved to the cramped high-rise flat they had been given by the government. No cash compensation came. The pattern of forced demolition and relocation, with developers and officials in corrupt cahoots together, is common all over booming China, and for the most part stoically accepted. But this particular doomed house was their only son's home, too—his wedding house—and he did not agree, and would not move.

So when the black sedans drew up outside, 18 days before the wedding, and thugs with axes and sticks got out and began to throw bricks at the windows, he furiously resisted. He climbed on the roof of the second storey, waving a big red national flag, but no one listened. He was dragged out and beaten up. The house was smashed to rubble, with everything in it, all the plants he loved; his mastiffs were taken away. He told the court later that the pain tore and pierced him like a knife. And the worst of it was that, in two months, Lanlan called off the wedding. After all, her prospective husband now had no house to give her.

He wrote appeal after appeal for proper compensation, but got no answer. So in October 2014 he began to arm himself. Personal firearms being forbidden, he bought three nail-guns and began to fiddle with them. One did the job for him: in February 2015 he managed to shoot the local party chief, He Jianhua, in the back of the head at close range at a New Year party in the village. For this he was sentenced to death in the People's Intermediate Court. His sentence was upheld this year in the Supreme People's Court, China's highest.

Plenty of protests were made on his behalf. Two party newspapers came out for him, as well as 12 distinguished lawyers. Most netizens of Weibo supported him. There were extenuating circumstances for the murder, not least the collapse of the wedding. Besides, Mr Jia had come to symbolise the plight of the unheeded little man in China, powerless before high-ups and unable to get justice. ("If the people had any choice in life," he said, "I would not have taken this dead-end path.") The courts were implacable, however. This was a long-planned murder of an official not especially to blame for the demolition; and all that online pressure to soften the law simply set a dangerous precedent.

His sentence might possibly have been commuted if he had turned himself in immediately after the murder, as he had meant to. But as he fled the scene in his car, he called Lanlan first to tell her what he had done. She was now married to another man and had a baby; but he still referred to her as his girlfriend, and had sent her 1,100 yuan in a red envelope for her wedding. While he talked to the woman who should have shared the house with him, He's friends violently bumped his car; and it was in their custody that the nurseryman of North Gaoying village arrived at the police station, and sealed his fate. ■