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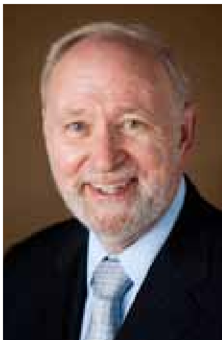
FROM THE CEO



Since the Milken Institute's founding more than two decades ago, one focus has been to widen access to capital and employment opportunities for groups that have historically been underrepresented. In the past few years, we have placed a special emphasis on women.

The philosopher of science, Sarah Richardson, reminds us that "99% of the human genome is identical, whether man or woman." Yet gender differences that truly are skin-deep have led to barriers and hiring patterns in the worlds of business and finance that perpetrate discrimination. Sometimes that discrimination is by design. But often – and more insidiously – it occurs unconsciously and is thus the harder to expose and confront.

Some of the most interesting work in social science in recent years has been on how executives, when hiring (or providing business opportunities), may make what they believe are bias-free decisions, but are in fact deeply rooted in the tendency for like to hire like. Recent research also suggests that the effective intelligence of problem-solving teams amounts to more than the sum of the members' IQs. As Anita Woolley (Carnegie-Mellon) and Thomas Malone (MIT) concluded, "If a team includes more women, its collective intelligence rises."

As part of our women's initiative, we have been acting to raise awareness of these findings in our many meetings – and to drive awareness of what needs to be done. At this year's Global Conference, we are providing a powerful platform for female perspectives on a variety of topics, and with a range of speakers. One of them is the founder of the U.K.'s 30% Club, whose goal is to see that at least 3 in 10 directors of FTSE-100 boards are women by the end of this year.

We've been inspired by the 30% goal to make our own: for this year's Global Conference, we aim to ensure that 30 percent of the speakers are women. (Last year, we were above the 20 percent mark.) This year, we are also working with private sector partners to develop an internship program that will include work at the Milken Institute and in the private sector, providing the intern with both for-profit and non-profit experience.

As proud as we are of these steps, we recognize it's just a beginning. All of us at the Institute are looking forward to expanding our women's initiative – and its impact – in the years to come.

Michael Klowden, CEO and President

In a cranky mood, JG, our loyal correspondent from Passadumkeag, Maine, wonders if we only publish her questions because we like to repeat the name of her hometown. That's not entirely true, JG. We would never lift a finger just to mention Lickskillet, Ohio, or Truth or Consequences, New Mexico. However, if anyone ever decides to write us from the shores of Lake Chargoggagoggmanchauggagoggchaubunagungamaugg in Massachusetts…

Meanwhile, JG, preview the splendid contents of the latest issue of the *Review*.

Philippe Legrain, a former economic adviser to the president of the European Commission, turns a gimlet eye toward the miraculous German economy. "Germany is using its clout in the European Union to try to reshape the eurozone in its own image," he writes. "But far from being an archetype of success that merits imitation, a close look reveals that Germany's economy is dysfunctional in surprising ways."

Staci Warden, director of the Institute's Center for Financial Markets, outlines a grim unintended consequence of the U.S. Treasury's effort to close the global financial system to terrorists. It's working – but in the process it's shutting out friends as well as foes. "Financial integration is essential to the growth of emerging-market countries as well as to the decentralization of economic power within them," she writes, "and their exclusion from the global financial system runs counter to the United States' broader goals of peaceful international cooperation, poverty alleviation and broad-based economic development."

Katharine Abraham, a former member of Pres. Obama's Council of Economic Advisers, slices and dices the employment numbers for clues to the fate of labor force dropouts. "Some of these people could well return to the workforce if sufficient demand for their services were to materialize," she argues. "And the more of them there are, the more misleading the unemployment rate is likely to be as an indicator of labor market slack – and the more of a mistake it could be for policymakers to rely on the unemployment rate to gauge how much room there is for short-term growth that doesn't set the stage for inflation."

Noah Smith, the creator of the economics blog *Noahpinion*, lays out the unpalatable options before Japanese policymakers, who must manage the government's Olympian mountain of public debt. "Japan is dealing with problems no country has ever confronted before," he writes. "It faces an epochal choice: whether to take the sure path of continued stagnation and keep its promise to the Baby Boom generation, or whether to launch a bold and risky experiment of debt monetization that would relieve the burden on the young."

EDITOR'S NOTE

Robert Looney, an economist at the Naval Postgraduate School in California, takes a hard look at the new Nigerian government's prospects for dodging economic and social disaster. "When Nigeria faced an equally dangerous tipping point following its 1967-1970 civil war, the country survived – thanks in part to the balm of oil-export revenues," he reminds. "Now, survival will largely depend on whether Nigeria has the societal strength to rein in rampant corruption, invest wisely in development infrastructure, and manage ethnic and religious strife."

Michele Boldrin and **David Levine**, both economists at the Washington University in St. Louis, challenge the conventional wisdom that the current patent system is absolutely vital to sustaining economic growth – or, for that matter, the idea that it does more good than harm. "It's not hard to convince people that patents cost them money," they write. "The hard part is explaining that, in most cases, the inherent production and marketing advantages to being the innovator offer plenty of room for profit even without the benefit of patent protection."

Charles Castaldi, a former correspondent for NPR, visits Buenos Aires in search of explanations for Argentine particularism in the wake of the latest political scandals. "Argentina now holds the dubious distinction of having fallen further and faster than any other in modern times," he writes. "A century of dysfunctional government and economic mismanagement have kept it on a Sisyphean slope; each time Argentina appears poised for a comeback, another crisis sends it tumbling."

And there's so much more: A new chapter from the latest edition of **Robert Shiller**'s *Irrational Exuberance* … an excerpt from *Climate Shock* by **Gernot Wagner** and **Martin Weitzman** … a taste of the Milken Institute's own blog, *Currency of Ideas.*

Happy reading, JG – and no hard feelings?

— *Peter Passell*

THE NARROWS, LAKE CHARGOGGAGOGGMANCHAUGAGOGGCHAUBUNAGUNGAMAUGG, WEBSTER, MASS.

COURTESY OF THE CHESTER C. CORBIN PUBLIC LIBRARY

BY PHILIPPE LEGRAIN

When Germany won soccer's World Cup last summer, the country rejoiced to the national anthem, *Deutschland Über Alles.* Most Germans are convinced that their economy is also a world beater – and it's hard to find much disagreement among the talking heads of economics and finance elsewhere. Finance Minister Wolfgang Schäuble regularly boasts that Germany is Europe's most successful economy, and German policymakers regularly school their European Union counterparts on the need to become more Germanic. As Chancellor Angela Merkel declared on her re-election 18 months ago, "What we have done, everyone else can do."

Not just can do, *must* do: Germany is using its clout in the European Union to try to reshape the eurozone in its own image. But far from being an archetype of success that merits imitation, a close look reveals that Germany's economy is dysfunctional in surprising ways – and that imposing its model on the rest of the eurozone is dangerous for the continent, not to mention the rest of the world.

THE ECONOMY BEHIND THE CURTAIN

If you drive a Volkswagen or a BMW and own a house full of Bosch or Miele appliances, it is easy to leap to the conclusion that the German economy is a hot ticket. Yet appearances are deceptive. Germany does make terrific cars and dishwashers, but it nonetheless suffers from low productivity growth, broken banks, inadequate investment and tepid GDP growth – as well as a rapidly aging population that will become an increasing drag on growth. Merkel's mercantilist economic strategy, which turns on suppressing wages to subsidize exports, is beggaring Germans as well as their neighbors.

Worship of all economic things German has a patchier history than many people remember. Back at the euro's creation in 1999, the German economy, overtaxed, overregulated and still suffering indigestion from unification with East Germany, was widely viewed as the "sick man of Europe." GDP growth was sluggish and unemployment high. In the years before the global financial bubble burst, it plodded on, outshone by fizzier growth in the United States, Britain and southern Europe.

But after the crash, plodding was seen in a new light. With the West laid low by flashy, but ultimately fragile, financial engineering, a

From 2011 to 2014 PHILIPPE LEGRAIN was an economic adviser to the president of the European Commission, José Manuel Barroso. His book, *European Spring: Why Our Economies and Politics Are in a Mess — and How to Put Them Right*, was named one of the *Financial Times*' best books in economics of 2014.

country renowned for its conservative financial management and solid industrial engineering looked like a winner.

While others had built houses of cards based on debt, Germany had prudently saved. While much of the West seemed ill-equipped for a new world of competition with China, German exports to the Middle Kingdom were booming. While unemployment soared elsewhere, Germany's jobless rate, below 9 percent in 2009, marched steadily downward. And in an age of fiscal incontinence, the government in Berlin has even balanced its budget. Indeed, as Europe's largest and most populous economy, its top exporter and its biggest creditor, Germany seems to hold all the cards.

Politicians and pundits of all stripes, from Bill Clinton to Nicolas Sarkozy, have queued up to praise this latest variant on the German Miracle. Moreover, Berlin boosters predict even brighter days ahead. In their 2012 best-seller, *Fat Years: Why Germany Has a Brilliant Future*, Bert Rürup, a former chairman of the German government's council of economic experts, and Dirk Heilmann, a journalist at *Handelsblatt*, the business newspaper, predicted that by 2030 Germany would become the world's richest large country. That would be no small achievement; today, Germany's GDP per person (measured in purchasing power terms) is a fifth less than that of the United States.

The almost-unchallenged German myth is that, thanks to regulation-shedding reforms of the labor market enacted a decade ago by Merkel's predecessor, Gerhard Schröder, the sick man morphed into an Olympic athlete. But while it is true that unemployment has plunged as millions of Germans found jobs (albeit, part-time "mini-jobs" in many cases) the rest of its economic record is unimpressive.

Germany, which has a lower GDP per person (adjusted for purchasing power) than more than a dozen other advanced economies ranging from Canada to Sweden to Australia, is hardly booming. Since the crisis struck in early 2008, it has grown by less than four percent, which is less awful than the rest of the eurozone, but half as much as the growth enjoyed by Sweden, Switzerland and the United States. Worse, since the euro's introduction in 1999, GDP growth has averaged only 1.2 percent a year, which places Germany 15th out of the 19 countries in the eurozone and well behind Britain (1.7 percent).

THE BILL COMES DUE

The explanation for Germany's lackluster economic performance is that Berlin hasn't taken many of the painful steps needed to become more dynamic since the sick-man era; rather, it has simply cut real wages and other costs. Businesses have failed to plow resources into productivity growth, as has the government. Investment plunged from 22 percent of GDP in 2000 to 17 percent in 2013. That is three percentage points less than in the United States, and lower even than in Italy.

Public investment, for its part, is a mere 1.6 percent of GDP. After years of neglect, infrastructure is crumbling. "Highway bridges are in such poor condition that lorries carrying heavy loads often have to make detours, while some transport infrastructure in waterways dates back to a century ago," points out Sebastian Dullien of the European Council on Foreign Relations. Outside the big cities, broadband Internet speeds are notoriously slow.

Germany has also fallen behind in investment in its workforce. It spends only 5.7 percent of GDP on education and training, much less than many other countries, including the United States (7.4 percent). While foreigners are inclined to admire Germany's traditional apprenticeship system, young Germans seem

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less keen: The number of new apprentices has plunged to its lowest level since reunification in 1990 and many positions go unfilled. Moreover, only 26 percent of Germans aged over 25 have university degrees, a far lower proportion than in France, Britain or the United States. A lower percentage of young Germans are graduates (29 percent) than young Greeks (34 percent). And the higher education that Germans are offered is not up to the standards of the global elite. By one rating, no German university ranked above 29th best in the world, and by another, no better than 49th.

Handicapped by underinvestment, Germany's sclerotic economy struggles to adapt. Despite Schröder's reforms, it remains harder to lay off a permanent employee than in any other rich member of the OECD. Starting a business is a nightmare: By this measure, Germany ranks 114th globally, behind Tajikistan and Lesotho, according to the World Bank's Doing Business rankings. Its big firms are all old and entrenched. There is no German Google or Facebook; the nearest equivalent in the digital sector, the software giant SAP, was founded in 1972. Indeed, Germany's industrial structure has scarcely changed in decades.

The services sector is particularly hidebound. Productivity in services ranging from transport to telecoms is often dismal, not least because these sectors tend to be tied up in red tape. Regulation of professional services is stricter than in all but five of 27 countries ranked by the OECD. In fact, in the professions, which account for a tenth of the economy, rules typically dictate who may offer what sort of service, how much they may charge and how they may advertise. For example, only qualified pharmacists can own a pharmacy and individual pharmacists can own no more than four of them. Other shops may not compete, even for nonprescription drugs.

Not surprisingly in light of the general environment of self-congratulation, the government has been slow to acknowledge that something's amiss. It has introduced fewer pro-growth reforms over the past seven years than any other advanced economy, according to the OECD. The upshot is that labor productivity growth has averaged only 0.9 percent a year over the past decade, far behind the 1.4 percent in the United States and less even than in Portugal.

German workers have paid the price for this poor performance. Starting with a corporatist agreement involving government, companies and unions in 1999, wages have been suppressed. Thus, while German workers' productivity has grown by 17.8 percent over the past 15 years, their pay (after inflation) has actually fallen.

Schäuble and others celebrate this wage stagnation as a key plank of Germany's superior competitiveness. But countries are not companies; while a business owner may wish to minimize wage costs, for society as a whole, wages are not costs to be minimized but benefits to be maximized – provided they are justified by productivity. Suppressing wages also harms the economy's longer-term prospects because it erodes incentives for workers to upgrade their skills and for businesses to invest in productivity-enhancing technologies.

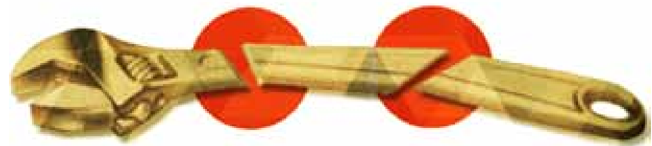
SPREADING THE JOY

Consider, too, that stagnant wages sap domestic demand, leaving Germany reliant on exports to sustain employment and growth. Exports have not disappointed, doubling since 2000 in large part because they are indirectly subsidized by Germans' artificially low wages. The euro has also provided a big boost. It has been much weaker than the mark was, helping German sales outside the eurozone. The lock created by a common currency has

prevented France and Italy from devaluing. And until the crisis, the capital flows that the euro facilitated fueled booming export markets in southern Europe. Germany has also been lucky; its traditional exports – capital goods, engineering products and chemicals – are precisely what China needed to power its breakneck industrial development since the turn of the century.

But with southern Europe now in a slump and China's growth slowing, the German export machine is sputtering. Its share of global exports is down from 9.1 percent in 2007 to 8 percent in 2013, as low as in the sick-man era. Moreover, since cars and other exports "made in Germany" now contain many components produced in central and Eastern Europe, Germany's export share is at a record low in value-added terms.

Germany's reliance on manufacturing is really a vulnerability, not a strength.



Most German exports are manufactured goods. Indeed, whereas manufacturing has shrunk as a share of GDP in most advanced economies over the past 15 years, it has expanded in Germany. That makes many people in countries with shriveled manufacturing sectors envious, but it shouldn't. There is nothing special about making things. Is making cars more valuable than developing medical technology? Is manufacturing washing machines more important than programming computers?

Note, too, that manufacturing represents an even bigger share of the economies of the Czech Republic, Ireland and Hungary. Does that make them more successful than Germany? In the end, the important issue is not what is made, but how much value it adds – and whether it is likely to continue adding as the global economy evolves.

In any case, German industry is unlikely to be able to defy gravity for much longer. Like agriculture before it, manufacturing tends to weigh less heavily in every economy over time – and that even goes for China, the workshop of the world. As technology improves, we can make better-quality goods more cheaply – think of flat-screen TVs. As people get richer, they devote more of their income to services (holidays, health care, household help) rather than spending it all on accumulating more stuff. So Germany's reliance on manufacturing is really a vulnerability, not a strength.

Unless its arthritic economy can adapt, Germany would be hit hard by a fall in demand for what it manufactures. Already, China is starting to compete directly with higher-end German products. And how, for example, would Germany fare if Google's self-driving vehicles disrupted the global car industry?

In the few areas in which German businesses have already faced the full brunt of Chinese competition, notably in solar panels, they have failed to up their game, resorting instead to appeals for EU protection. For similar reasons, German politicians are now keen to see Google broken up. Germany's position is particularly precarious because it is reliant on four sectors – vehicles, machines, electronic devices and chemicals – for more than half of its exports.

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Germany is already losing its edge in energy-intensive sectors like chemicals. Thanks in part to the shale-gas revolution in the United States, German companies pay almost three times as much for electricity as their American competitors. And the gap isn't likely to narrow: Berlin is committed to phasing out nuclear power and replacing it with pricey renewables rather than cheaper gas-powered generation.

As a result of these surpluses, Germany has become Europe's biggest net creditor. Back in 2000, its overseas assets barely exceeded its foreign liabilities. By the end of 2013, its net international investment position had risen to a whopping €1.3 trillion – almost as large as China's. But that is hardly unalloyed good news since the slosh of assets ending up abroad made the fortunes of German financial institutions highly vulnerable to the global debt meltdown. A study by the DIW economic research

Thanks in part to the shale-gas revolution in the United States, German companies pay almost three times as much for electricity as their American competitors.

institute in Berlin suggests that Germany lost €600 billion, the equivalent of 22 percent of annual GDP, on the value of its foreign portfolio investments between 2006 and 2012.

Germany's export obsession resulted in a whopping current-account surplus of $283 billion in the first 11 months of 2014, exceeding 7 percent of GDP. Schäuble and others view this as emblematic of Germany's superior competitiveness. But if Germany is so competitive, why don't businesses want to invest there?

This huge surplus is, in fact, a symptom of Germany's economic malaise. Suppressed wages swell corporate surpluses, while low consumer spending, a stifled service sector and stunted start-ups suppress domestic investment, with the resulting surplus savings often squandered overseas.

While compressing wages to subsidize exports is bad for Germany, it is worse for the rest of the eurozone. Far from being an "anchor of stability," as Schäuble claims, Germany spreads instability. Germany escaped the real estate frenzy. But German banks' reckless lending of Germans' excess savings financed property bubbles in Spain and Ireland, funded an unsustainable consumption boom in Portugal and lent the profligate pre-crisis government in Greece the rope with

PETER HORVATH

which to hang itself. And now that the bubbles have burst, it is exporting deflation to those debtor countries.

Nor is Germany a "growth locomotive" for the eurozone. On the contrary, its weak domestic demand is a drag on growth elsewhere in Europe.

Foisting the German adjustment model on the rest of the eurozone makes matters worse. The German-inspired conventional wisdom that wages in southern Europe are too high is at best simplistic, and at worst just plain wrong. Wages fell as a share of GDP everywhere in the pre-crisis years. Slashing them now depresses domestic spending and makes debts harder to bear.

For struggling southern European economies whose traditional exports have been undercut by Chinese and Turkish competition, the solution is not to try to produce the same old stuff at lower wages, but to invest in moving up the value chain. In any event, the eurozone is collectively too big and global demand too weak for it to rely solely on exports to grow out of its debts – hence stagnation will be its lot as long as Germany is emulated.

Trying to turn the eurozone into a greater Germany is also harmful to the rest of the world, not least the United States. Stagnant European demand crimps American exports, while suppressed wage growth gives eurozone exports an unfair edge – and ultimately risks a protectionist response.

The European Central Bank's turn to quantitative easing has sent the euro plunging against the dollar. In early March, a euro bought only $1.08 – down from $1.39 as recently as May 2014. That may be desirable for the eurozone as a whole, given Germany's failure to contribute to regional growth. But it is perverse for the rest of the world, considering that the eurozone is collectively running a $300 billion-plus current-account surplus. In the meanwhile, German savings that once sloshed into southern Europe are now being sprayed around more widely, with the country's notoriously badly managed banks still in charge of choosing where it goes.

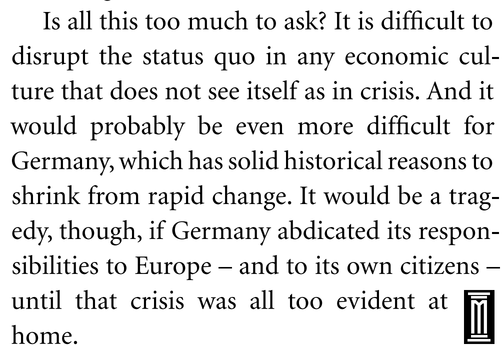
DIGGING OUT

German policymakers have spent the post-crisis years lecturing the world in general and southern Europe in particular on the virtues of the German Way. Yet the German model urgently needs an overhaul.

Germany should focus on improving productivity, not "competitiveness." Unleashing competition and enterprise would be a good place to start. While the German economy excels at incremental innovation and cost cutting, it needs to become much more adaptable in a world increasingly prone to disruptive technological change.

Workers should be rewarded for their productivity gains. And with a balanced budget, a triple-A credit rating and an economy in which stimulus couldn't possibly generate inflation, the government should take advantage of near-zero interest rates to invest in the country's infrastructure and to encourage businesses – especially start-ups – to invest, too. Germany would also do well to welcome dynamic young immigrants to stem its demographic decline; with an average age of 45, its population is the oldest in the EU and is shrinking fast.

Is all this too much to ask? It is difficult to disrupt the status quo in any economic culture that does not see itself as in crisis. And it would probably be even more difficult for Germany, which has solid historical reasons to shrink from rapid change. It would be a tragedy, though, if Germany abdicated its responsibilities to Europe – and to its own citizens – until that crisis was all too evident at home.



Nigeria

ON THE EDGE OF THE ABYSS

BY ROBERT LOONEY

To judge by the aggregate numbers, Nigeria, by far the largest country in Africa in terms of population, is showing signs of coming into its own in the new century. With GDP expansion averaging over 6 percent in 2000 to 2013, the economy has become Africa's largest. In the process, it has graduated to the World's Bank's list of lower middle-income countries, with a GDP per capita (in terms of purchasing power) above $5,000.

But that was in 2013. Today, there is little cause for celebration, as the country can no longer afford the luxury of ignoring a host of long-festering problems that have been exacerbated by the recent collapse in the price of its cardinal export, oil. The government budget has been gutted. Wretched transportation and electric-power infrastructure sharply constrain non-oil growth, while high youth unemployment and the divide between the impoverished Muslim north and the relatively affluent Christian south bolster the ultraviolent Boko Haram insurgency. Meanwhile, pervasive corruption makes every problem harder to solve and undermines civil society.

Muslim youth gang in Kano State.

Each of these factors will present a daunting challenge to the newly elected government of Muhammadu Buhari – Nigeria's first opposition candidate to be elected president. Taken collectively, they have prompted the U.S. National Intelligence Council (the public-private group that serves as a link between the intelligence and policy communities) to question both Nigeria's ability to sustain its economic growth and its long-term viability as a nation-state. In its 2005 "Mapping Sub-Saharan Africa's Future," the NIC warned that Nigeria could collapse by 2020. In 2008, the NIC ranked Nigeria 13th on its list of the most likely candidates for state failure. By 2012, Nigeria had moved "up" the list to ninth – though the estimated date of its meltdown was extended to 2030.

The NIC's forecasts are based on a projection in which Nigeria's slide toward communal violence in the face of weakening social and political institutions pushes the country over the tipping point. None of this is written in stone, however. And in their defense, Nigeria's boosters can point to trends running in the opposite direction. Gains in agricultural productivity, together with progress in governance reform and economic development at the regional level, have the potential to offset the dispiriting dysfunctionality of leadership at the federal level.

When Nigeria faced an equally dangerous tipping point after its 1967-1970 civil war (linked, no surprise, to ethnic conflict), the country survived – thanks in part to the balm of oil-export revenues that followed the rise of OPEC. With a technological shift that threatens to depress fossil fuel prices for the indefinite future, however, oil is unlikely to serve as the glue again. Now, survival will largely depend on whether Nigeria has the societal strength to rein in rampant corruption, invest wisely in development infrastructure, and manage ethnic and religious strife.

ROBERT LOONEY teaches economics at the Naval Postgraduate School in Monterey, Calif.

SOME HARD TRUTHS

Even in the best of times, Nigeria was extremely vulnerable to the volatility of the global oil market. Revenues from Nigeria's oil exports account for more than 90 percent of the country's export earnings and finance 70 to 80 percent of the federal government budget. As a result, Nigeria has been pounded by the 40 percent-plus fall in oil prices since mid-2014.

Not only is the country facing massive shortfalls in oil revenues because of sagging prices, but it has relatively little hope of offsetting the fall by increasing production in the near or middle term: with security issues in mind, foreign oil companies have invested little in exploration or development in recent years. Nigeria's currency, the naira, has been allowed to depreciate since oil prices started to fall. But the decline (on the order of 20 percent) won't do much to stimulate exports. Meanwhile, managing to sustain imports has badly depleted the country's foreign exchange reserves. As a result, the government has been forced to adopt a severe austerity program, even as expanded public expenditures are desperately needed to combat Boko Haram and make the infrastructure improvements required for both economic development and social stability.

Nigeria, like all oil-dependent economies, had plenty of notice that revenues could go down as well as up. And like some others, it established a buffer account to amass funds in boom times and disgorge them in hard times. By delinking government expenditures from oil revenues, the stabilization fund was

PREVIOUS PAGE ©NIGEL DICKINSON/ALAMY

Boko Haram at work.

ASSOCIATED PRESS/ABDULKAREEM HARUNA

intended to insulate the Nigerian economy from external shocks.

The idea of building cash reserves when oil revenues exceed a benchmark is sound. Unfortunately, when the fund was started, corruption was not factored in. As a result, Nigeria's president was left with the final say as to how funds would be disposed.

At the end of 2014, the fund had a balance of just $4 billion, compared with $9 billion in December 2012. Moreover, the bulk of the withdrawals took place before the second half of 2014, when oil prices were still high and the account balance should logically have been rising. Much of the decline resulted from revenue diversion to assorted regional power brokers, whose support was deemed crucial to the success of President Goodluck Jonathan's party in the 2015 elections. In 2013 alone, then-President Jonathan approved two $1 billion transfers from the fund to state governors.

With both the stabilization fund and foreign exchange reserves vanishing rapidly, the government had little choice but to propose

Mass transit in Lagos, old-style.

ASSOCIATED PRESS/SUNDAY ALAMBA

spending cuts exceeding 10 percent in its 2015 budget. Most of the cuts will come from capital expenditures, meaning that critically needed infrastructure improvements will be shelved. The president, it seems, hadn't lost sight of which side his bread is buttered on: the budget calls for increases in outlays for what can only been seen as patronage – notably, government salaries.

Further exacerbating the effects of the oil price shock is the government's failure to pass the 2008 Petroleum Industry Bill. As originally written, the PIB contained reforms that would have brought greater certainty to the rules regarding oil sector taxation, as well as altering the way in which oil revenues were transferred to the states and restructuring the Nigerian National Petroleum Corporation (the place where foreign oil company royalties go to disappear). The resulting uncertainty over the rules of the oil game has predictably stifled foreign investment in Nigeria's

oil sector, thus limiting expansion in productive capacity.

One of the biggest casualties of Nigeria's falling oil revenues is the country's decaying infrastructure. Most Nigerian roads, refineries, railways, airports, power plants and water/sanitation utilities date to the oil boom in the 1970s. Since then, public investment has failed to keep pace with depreciation, let alone with rising needs in a country whose population has more than doubled since 1980. Today, infrastructure inadequacy, especially in transportation and energy, poses major constraints to sustained, broad-based economic growth.

A 2013 African Development Bank report was politely scathing in its analysis of these infrastructure deficiencies, estimating that 40 percent of the federal primary road network is in poor condition and that only 18 percent of the country's 197,000 kilometer road system is paved. The backbone of the rail network is over 100 years old, and, as of 2007, only 25 percent of its trains were operational.

But the imperative to protect political insiders trumps the needs of the commonwealth. At 14 percent of the budget, government capital spending will be well below 2003 levels. And while Abuja has stressed that the sharp cuts in public investment are temporary, it hasn't explained where the money will come from until oil makes a comeback.

The one financing option is stepped-up borrowing, with a proposal already in the works to raise close to $18 billion over the medium to long term, mostly from China. Currently, Nigeria's debt-to-GDP ratio is modest, thanks in large part to an international debt pardon in 2005. Debt service costs could become problematic, however, if the value of the naira continues to fall and oil revenues effectively remain the sole source of foreign exchange.

THE CORRUPTION CURSE

While inadequate funding has certainly contributed to Nigeria's infrastructure deficits, corruption may be equally to blame. The World Bank estimates corruption's direct cost to Nigeria to be as high as 12 percent of GDP, with much of it originating in the contracting, construction and provision of infrastructure services. Corruption has not only increased the cost of construction, but also reduced its

quality and siphoned off user fees needed to service debt – not to mention undermined lenders' willingness to finance the next projects and the next.

According to the World Bank's Worldwide Governance Indicators, Nigeria's control of corruption, which showed significant improvement in 2003 to 2008, has deteriorated since President Jonathan took office. In 2008, Nigeria's control of corruption ranked in the merely dismal 21st percentile among nations; by 2013, the country had fallen to a kleptocratic ninth percentile.

Corruption is so ingrained that President Jonathan promptly dismissed the governor of the central bank for publicly suggesting that his administration was responsible for the approximately $20 billion in "missing" Nigerian National Petroleum revenues.

GROWTH WITHOUT JUSTICE

Oil dependence polluted by rampant corruption – a pattern so common that economists refer to it as the "natural resource curse" – might alone be sufficient to explain Nigeria's failure to lift a majority of its population out of poverty, or even to absorb the country's rapidly expanding workforce. According to the World Bank, nearly two-thirds of Nigerians lived below the international poverty line of $1.25 a day in 2010. In fact, Nigeria's cup of woes runneth over.

In contrast to the East Asian tigers, which turned their young, underemployed labor forces into an asset for rapid, sustained industrialization, Nigeria's restless and frequently unemployed youth are a daunting liability. More broadly, social instability has been fed by the federal government's inclination to use resources in ways that widen divisions along regional and religious lines rather than narrow them.

Economic development favors the country's Christian south over its predominately Muslim north. Poverty and unemployment are especially severe in the northeast, where the Boko Haram insurgency is based and finds the bulk of its recruits. In the northeastern states of Adawama and Yobe, poverty rates range as high as 70 percent, while unemployment is stuck near 35 percent. Similarly, in the neighboring state of Borno, where Boko Haram began, almost half the school-age population receives no formal education; youth illiteracy is about 80 percent.

These numbers are all the more shocking when viewed against an estimate by New World Wealth (a global market research firm focused on the rich) that the number of Nigerian millionaires increased by nearly half in the six years from 2007 to 2013. Not surprisingly, the country's wealthy are concentrated in Lagos (the commercial capital), Abuja (the political capital) and Port Harcourt (the oil hub).

Barring a fundamental turnaround in governance – one that deals directly with corruption, religious division and poverty – it's hard to see how Boko Haram (or successor groups) will be eradicated. Even the armed effort to contain the insurgents in the north has been hindered by endemic corruption. There are widespread reports that the Nigerian military is demoralized because senior officers are appropriating their pay along with money intended to buy weapons.

POINTS OF LIGHT

It's not hard to see how falling oil revenues, infrastructure dearth, corruption, chronic poverty and the insurgency might lead to a vicious circle, creating a truly failed state out of this highly imperfect one. But not all the news coming out of Nigeria is grim.

Start with agriculture, which generates more than one-fifth of GDP and nearly one-

Decades of oil spills have devastated the Niger Delta.

PIUS UTOMI EKPEI/AFP/GETTY IMAGES

third of employment. Thanks for the most part to benign neglect on the part of Abuja, farm output has been expanding at a rapid clip since 2000. Indeed, the Jonathan administration has been the first to show much interest in agriculture, introducing what may turn out to be its main policy achievement: the Agricultural Transformation Agenda.

Implemented in mid-2012, the ATA includes a series of initiatives aimed at reducing Nigeria's increasing reliance on food imports as the population grows and the country urbanizes. And none too soon: Nigeria currently spends over $11 billion annually on imported rice and sugar, commodities in which it was self-sufficient during the 1960s.

A major component of the ATA is the Growth Enhancement Scheme. This plan specifically focuses on agricultural productivity by subsidizing the costs of such major inputs as fertilizer and seedlings. It is also providing free mobile phones to farmers, which help provide timely information on input and crop prices and facilitate mobile banking to expand credit and payment options to this traditionally underserved group.

In 2013 alone, the ATA's first full year of operation, the government claims that nearly a half million jobs were created – small change in a country of more than 170 million,

Mass transit in Lagos, new-style.

ASSOCIATED PRESS/SUNDAY ALAMBA

but a beginning. Success in raising productivity (though not reducing rural poverty) suggests that agriculture could provide the next government some breathing room in coping with the decline in the oil industry. In the intermediate term, rising food production and declining food imports could help offset the most direct effects on consumers of oil-related volatility. And in the longer term, it may moderate income and wealth inequality.

Just as the ATA has begun to demonstrate the economic potential of the Nigerian countryside, so the recent transformation of Lagos shows what ingenuity, hard work and improved governance can accomplish in an urban context. Composed of many separate municipalities, the Lagos sprawl of 12 million (or 20 million by some estimates) was once the most corrupt, crime-ridden and public-service-starved Nigerian state.

Then, in 1999, Bola Ahmed Tinubu, an ambitious state governor, began experimenting with ideas for beating back the chaos.

The initial stage of the experiment involved raising revenues. Those who owed most of the tax had always found it easier to grease the relevant palms than to pay. The reform government initially contracted with a private company to collect taxes, offering it a percentage of the take as incentive. And it subsequently cleaned its own house, replacing a compliant bureaucracy with one that owed allegiance to the reform governor. As a result, tax collections (adjusted for inflation) increased sixfold in 1999 to 2011. Nearly three-quarters of Lagos' revenues are now internally generated, leading other states to follow its example.

In exchange for getting residents to pay taxes, the Lagos state government expanded both public services and law enforcement. It has begun building and restoring basic infrastructure, with 60 percent of the state budget now earmarked for capital projects. To raise

additional financing for infrastructure, the Lagos government has tapped bond markets and entered into a series of innovative public-private partnerships. While each deal is individually negotiated, these agreements generally involve a long-term contract in which a private party bears significant risk and management responsibility in return for substantial profit potential.

Several of these partnerships have involved mass transit. In 2008, the Lagos bus system was re-launched under a PPP in which the state built the depots, terminals and dedicated road lanes, while private enterprise provided the vehicles and operated them. Today, 200,000 people use the system daily, making a dent in traffic delays in what was arguably the most congested city in Africa.

Building on the success of the bus partnerships, the Lagos government is moving ahead with an ambitious light-rail project. Under its terms, the giant China Civil Engineering Construction Company will design and build the tracks and terminals, while a private Nigerian consortium called Eko Rail will supply the trains and operate the network for 25 years.

The transformation of Lagos shows that it is possible for a regional government – notably, one without oil revenues to corrupt it – to initiate a virtuous circle of economic growth and improved governance. In return for expanded tax compliance, the Lagos government has held itself accountable for increasing the scope and quality of state services. In turn, these inputs increase the viability of businesses, enabling them to pay additional taxes to be used for further investments and improvements.

Don’t expect the Lagos miracle to change the way the federal government operates. Even in the unlikely event that oil prices – and thus Nigeria’s federal budget – rebound soon, the country’s sagging infrastructure, regionally skewed development, high unemployment rates and widespread corruption constitute structural impediments that would take decades to correct on the national level, if ever. There isn’t much incentive for national politicians to hold themselves accountable for correcting them as long as oil revenues and foreign loans are available to buy support in the next election.

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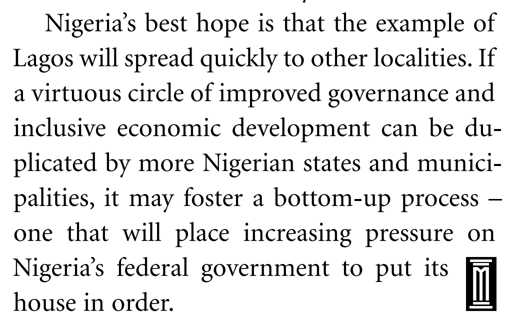
Moreover, don’t expect business – foreign or domestic – to save the non-agricultural sector. The World Bank puts Nigeria at 170th (out of 189 countries) on its Ease of Doing Business rankings – just ahead of Zimbabwe, but behind the likes of Iraq, Burkina Faso and Tajikistan. In part, that’s a reflection of the difficulty of conducting business in an environment in which almost everyone in authority has a hand out. In part, though, it is infrastructure: Nigeria ranks a miserable 187th in business access to electricity.

Nigeria’s best hope is that the example of Lagos will spread quickly to other localities. If a virtuous circle of improved governance and inclusive economic development can be duplicated by more Nigerian states and municipalities, it may foster a bottom-up process – one that will place increasing pressure on Nigeria’s federal government to put its house in order.



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Casualties *of* War

The unintended consequences of America's financial weapon of mass destruction

BY STACI WARDEN

The dominance of the U.S. financial system in global economic activity generates huge benefits for the United States – not least by giving Washington a potent means to strangle terrorism. But, as is now becoming apparent, this capacity to project financial power to the ends of the earth is yielding unintended consequences that are not in the United States' interests. And keeping the metaphoric baby safe while throwing out the bathwater will not be easy.

First, a little history. Each of the 19 hijackers who carried out the 9/11 attacks had a checking account in his own name at a U.S. bank. They received wire transfers from all over the world to finance their activities, and the transfers went unnoticed because the support was funneled in small, regular sums through an elaborate network of front companies, wealthy donors and charities. The breadth and sophistication of these operations, carried out for years under the radar of the banks involved, was a wake-up call for Washington. And so began the United States' campaign to excise the bad actors from the networks that carry the financial lifeblood of the global economy.

FINANCIAL WARFARE

With hindsight, the approach seems obvious. Criminal syndicates need to buy weapons, recruit and pay members, reward the families of soldiers and martyrs, and purchase intelligence. As with any global business, a robust, efficient financial supply chain is critical to operations, and that means unfettered access to global banking. The U.S. Treasury's key insight, Juan Zarate, the first head of the department's Office of Terrorism and Financial Intelligence (TFI), explained in his book, *Treasury's War: The Unleashing of a New Era of Financial Warfare*, was to leverage the self-interest of legitimate financial institutions to police illegitimate financial flows.

Treasury officials reasoned that the banks would close accounts and terminate correspondent-banking and trade-facilitation services with suspicious clients rather than risk fines or damage to their reputations. Moreover, all of this could create a virtuous circle: as bad actors were no longer able to hide in plain sight, their scramble for camouflage would actually make them easier to identify.

Financial sanctions and follow-the-money intelligence strategies had long been used by Washington to enforce trade and investment embargos – notably, against Cuba and Iran – while anti-money-laundering tools have been fundamental to the battle against narcotics trafficking. But after 9/11, the authority to wage financial warfare was sharpened. Enforcement agencies were given new authority to label wrongdoers, isolate financial institutions and seize assets.

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Section 311 of the USA Patriot Act enabled the Treasury to designate a bank to be a "primary money-laundering concern" without having to prove criminal intent. And the power of the provision is beautifully illustrated by actions against North Korea designed to stop its counterfeiting, money laundering and narco-finance activities. The United States declared the country's principal international banker, Banco Delta Asia in Macau, a bad bank under Section 311, which transformed it into a financial pariah overnight. First, Macau's regulators froze the assets of all North Korean government accounts, causing a run by other depositors; simultaneously, the 311 designation induced banks around the world to sever relations with the Macau bank. The failing bank was subsequently taken over by the government and all North Korean government accounts were closed.

The secondary impact of the Treasury initiative proved as important as the initial strike. Banks across Europe and Asia shut down their own North Korean government accounts to avoid a similar bad-bank designation. And after decades of dodging broader financial sanctions, a North Korean negotiator allegedly admitted to a U.S. official, "you finally found a way to hurt us."

The case for the fundamental importance of access to the infrastructure of international finance was recently made forcefully (if histrionically) by Russia. When, in September 2014, the European Parliament urged member-states to consider banning Russia from the SWIFT network (a standardized electronic payments-messaging platform for correspondent banking), the head of VTB Bank, Russia's foreign-trade bank, said that he would consider such a move an act of war: "If Russian banks' access to SWIFT will be prohibited, the U.S. ambassador to Moscow should leave the same day. Diplomatic relations must be finished," he warned.

Prime Minister Medvedev recently doubled down, saying that "Russia's response would be unlimited" – a statement widely interpreted to mean that Russia would cut off gas supplies to Europe.

All told, the success of Treasury's tactics has transformed the Treasury from a minor player to the epicenter of U.S. financial intelligence and antiterrorism efforts. One symbol of that success: the appointment of David Cohen, undersecretary at TFI, to the position of deputy director of the CIA – the first time the job has been given to an intelligence outsider.

INSIDE THE PLUMBING

Financial-warfare strategies do not succeed because the United States is a giant market and counterparty for trade and investment flows globally (though it is), but rather because most international financial transactions are in dollars. Every dollar transaction on the planet that involves bank deposits (as opposed to currency) must eventually find its way back to the balance sheet of one of the U.S. clearing banks. If a bank in, say, Nigeria, needs to make a dollar payment on behalf of one of its customers to a beneficiary in, say, Malaysia, it needs to have access to a correspondent bank account at a U.S. clearing bank. If it has direct access, it instructs the U.S. bank to debit its account and make a payment to the U.S. clearing bank used by the Malaysian bank. If the Nigerian bank does not itself have a correspondent account, it uses nested correspondent accounts with a series of banks until it reaches a U.S. clearing bank.

U.S. clearing banks have accounts directly at the Federal Reserve. And the Fed stands in the middle of each payment transaction, netting them out in the settlement process. So if a bank anywhere in the world serves as a go-

PAGES 22-23 AND 24-25: REUTERS/ERIC MILLER

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After decades of dodging broader financial sanctions, a North Korean negotiator allegedly admitted to a U.S. official, "you finally found a way to hurt us."

between in a dollar transaction, it will, in some way, at some point, be subject to Fed oversight and U.S. banking regulations.

Note that because the Fed stands between each party to a clearinghouse bank transaction, there is no settlement or counterparty risk between the clearing banks. But throughout the rest of the financial system, correspondent banks are subject to significant counterparty risk – risk that the party on the other side of the transaction won't honor its contractual promises. Back in the day, personal relationships among the players was crucial to mitigating counterparty risk, and temporary liquidity shortfalls could often be settled with a phone call between bank CEOs. But globalization, data-driven risk analysis and heightened regulatory scrutiny have raised the bar on both compliance and risk mitigation in correspondent banking, and personal trust-based practices have become, for the most part, a thing of the past.

Unfortunately, at the turn of the millennium, technology-centric credit assessment and compliance systems still fell far short of hoped-for effectiveness in identifying and thwarting illicit flows. The U.S. Senate's Permanent Subcommittee on Investigations issued a blistering report six months before 9/11, finding that money-laundering surveillance practices at large U.S. banks were "often weak and ineffective" due to a lack of due diligence on services promising upfront fees and to the practice of nested (and thereby less-than-transparent) correspondent banking relationships. In the wake of 9/11, banks began to take steps to beef up their compliance systems. And then the Riggs Bank scandal exploded.

UPPING THE ANTE

In 2002, improprieties were found in over 150 accounts held by the Kingdom of Saudi Arabia at the Washington-based Riggs Bank, including unexplained wire transfers in the millions of dollars. Separately, it came out that a Riggs Bank employee had accepted a $3 million

deposit in shrink-wrapped currency, packed in suitcases, on behalf of the kleptocratic dictatorship of Equatorial Guinea. The final straw for Riggs was the discovery that it had actively managed accounts held in the name of Chile's General Augusto Pinochet. The Office of the Comptroller of the Currency the bank's regulator, issued it a cease-and-desist order, and Riggs, which had once billed itself as "the most important bank in the most important city in the world" was forced out of business, with its operations sold to PNC Bank in 2004.

The reverberations from Riggs were felt across U.S. correspondent banks. But regulatory fines for noncompliance remained affordable compared with the cost of beefing up compliance capacity. Since the global financial crisis, however, this is no longer true. The Justice Department has come down ever more aggressively against banks, and fines have skyrocketed. In 2012, HSBC agreed to pay almost $2 billion, a record at the time, for enabling drug cartels in Mexico and Colombia to launder almost $900 million through HSBC Mexico, and further, for effecting payments for a number of sanctioned countries. Two years later, JPMorgan Chase was also fined $2 billion for failure to report suspicious activity related to the operations of Bernard Madoff.

The list goes on and on. Over the past five years, Lloyds TSB, Credit Suisse, Barclays, ING, Standard Chartered and RBS have each been fined hundreds of millions of dollars for sanctions violations with respect to Iran, Sudan, Libya, Cuba and Burma. And in July 2014, BNP Paribas, France's largest lender, broke all records when it pled guilty to sanctions violations and agreed to pay fines totaling almost $9 billion for having cleared almost $200 billion in transactions for Iran, Sudan and Cuba since 2002. Since then, the Justice Department has also snared Germany's second-largest lender, Commerzbank, for sanctions violations associated with serving a state-sponsored shipping company in Iran. It will pay a fine of $1.45 billion.

Banks have received the message and are now spending billions to improve their anti-money-laundering and compliance processes. According to a recent KPMG survey, large banks now collectively spend upwards of $10 billion annually to comply with global anti-money-laundering and combating-the-financing-of-terrorism sanctions. JPMorgan Chase, for example, said in a recent letter to shareholders that it spent $2 billion in 2014 and hired 13,000 (no misprint) compliance employees. Standard Chartered recently announced that regulatory costs were adding 1 to 2 percent – or $100 million to $200 million – to its costs every year. The bank has doubled the number of employees in its financial-crimes unit and increased its legal and compliance head count by 30 percent in the past year.

FROM RISK MANAGEMENT TO RISK AVOIDANCE

U.S. banks cannot conduct business with countries or individuals that appear on the U.S. Treasury's Office of Foreign Asset Control lists. The usual suspects – Iran, Cuba and North Korea – figure prominently. But in addition, the office's Specially Designated Nationals list covers individuals from all over the world and currently numbers over 6,000. Banks must further demonstrate that they have adequate processes in place. (JPMorgan, for example, was taken to task – and paid a nine-figure fine – for having weak systems, not for any actual wrongdoing.)

The regulations require banks to take a risk-based approach, using extra care with certain regions and industries as well as certain products and customer types. This

means, among other criteria, shunning business in countries with weak regulatory-enforcement mechanisms, in countries where the banking sector is not well understood and in countries where information is limited and know-your-customer requirements are difficult to establish.

Consider, though, that core services like correspondent banking and trade finance pose a double problem for banks. On the one hand, they are high-risk activities from a money-laundering and terrorist-finance point of view, and thus demand costly oversight. On the other, they are low margin businesses that must generate high volume to be profitable. As a result, as compliance costs escalate, banks are wondering whether they should be in these businesses at all. As one senior banker who wished not to be identified complained, "to do a $50 million transaction, wherein we made $20,000, somebody on my team had to spend a week going through a negative media compilation as thick as a telephone book. That is not a sustainable business model for me."

The idea behind the United States' new strategy of financial warfare was that legitimate financial institutions around the world could effectively be forced to make a coordinated effort to preserve the integrity of the global financial system by making sure that criminals couldn't gain access. Nowhere, however, did the strategists contemplate what would happen if banks decided to exit correspondent banking and trade-finance altogether. But that is what's happening.

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In a process that has come to be called "de-risking," large U.S. correspondent banks are exiting their correspondent and other core banking relationships in droves. According to a private survey of 17 clearing banks that was reported in *The Financial Times*, thousands of correspondent banking relationships have been severed since 2001, with a 7 percent average decline in relationships, and with several banks axing one-fifth of their relationships.

According to an International Chamber of Commerce report, in a survey of 300 banks in 127 countries, anti-money laundering and combating the financing of terrorism requirements were a "major inhibitor" to the provision of trade finance, resulting in an unwillingness to provide the service by 68 percent of the banks surveyed. For example, in January 2013, when the Office of the Controller of the Currency issued a cease-and-desist order against JPMorgan Chase for deficiencies in its compliance systems, the bank responded by closing over 500 correspondent banking relationships and, according to one knowledgeable observer, it hasn't opened a correspondent banking relationship since.

Some terminations were desirable – that's the whole point of getting banks to do their own policing. The problem, though, is that among the thousands of correspondent relationships that have been terminated by global banks worldwide, the majority of them were ended without cause, simply as a matter of benefit-cost-risk analysis rather than for malfeasance on the part of the corresponding bank or its clients.

"Because of regulatory burdens, of course we have repositioned to the biggest clients in the biggest markets," acknowledged one banker. Moreover, because regulatory requirements change with some frequency and different jurisdictions impose different regulations, it is probably impossible for a global bank to be fully compliant with anti-money-laundering and combating-the-financing-of-terrorism regulations in its core banking businesses globally. This naturally heightens each bank's overall level of risk aversion.

TED ALJIBE/AFP/GETTY IMAGES

It used to be that bankers would rely on personal experience and judgment to assess risks and then set fees commensurate to those risks. They would have confidence that as long as their banks performed the risk analysis with reasonable due diligence, mistakes could be defended. Now, though, in an environment of high reputational risk and high financial penalties, risk is increasingly eschewed, period. To put it another way, a system of risk avoidance has displaced a system of risk management. Douglas Flint, HSBC chairman, recently acknowledged as much, stating that there was "an observable and growing danger of disproportionate risk aversion creeping into decision-making in our businesses."

The fundamental issue lies in the reality that the payoff calculation for these business, and the individuals operating within them, is now akin to that of selling a put option: there is limited upside for success (the promised fee) and catastrophic downside for failure (including mega-fines and demotions). So, the bank examiner at the Office of the Comptroller of the Currency, the compliance officer at the bank and the banker who needs to get permission to do a deal all err on the side of caution, imposing a regulatory safety buffer around what they are willing to allow or undertake.

Everybody self-polices. As one senior banker explained, "the problem is that you have to go very far up the food chain to get to somebody who can make a thoughtful, nuanced decision if risk is involved, and there is a very small chance that somebody would be willing to stick their neck out for such a small piece of business. People would think I was weird if I did that."

THAT BABY AND THE BATHWATER

Banks can still make money under such strictures. Indeed, in most industries facing tough regulation, some players (typically the very large ones) can thrive because the barriers to entry become more daunting and competition becomes less stiff. But profitability is hardly the proper measure of the societal value here. International banking and trade-finance systems are the lifeblood of the global economy, and the inability to participate in international

finance can have major deleterious consequences for national banking systems, their clients and the countries in which they reside.

Note, moreover, that transactions in poor countries, post-conflict countries and already marginalized sectors pose the greatest risk to banks. But these are precisely the markets that depend most heavily on the services of international banks because their domestic banks are weakest. Africa is particularly vulnerable, for example, because it lacks solid financial systems and because its exports are disproportionately transacted in dollars.

Again, it's the U.S. dollar system that's critical, not the U.S. market. According to a SWIFT white paper, 39 percent of Africa's financial flows go through the United States, although only 9 percent of commercial flows do.

Global financial integration – of core banking services, securities services and in particular trade finance – is essential to the growth of emerging-market countries as well as to the decentralization of economic power within them – and their exclusion from the global financial system runs counter to the United States' broader goals of peaceful international cooperation, poverty alleviation and broad-based economic development.

For example, the United States has spent over $200 million per year in international aid to Liberia since a democratically elected government finally ended the brutal reign of warlord Charles Taylor (and funding levels have increased with the outbreak of Ebola in West Africa). Yet, at the same time, due to its small economic size and weak regulatory environment, Liberia is becoming financially isolated.

In 2007, the International Bank (Liberia) Limited (IBLL), Liberia's oldest and second-largest commercial bank, was acquired by a consortium of American and African investors, with a U.S.-owned entity taking the majority share. The new owners modernized the bank and increased its correspondent relationships to include Standard Chartered, Citibank, Commerzbank and Standard Bank, among others. But, beginning in 2012, the International Bank (Liberia) Limited's correspondent banks began exiting Liberia or closing its U.S. dollar accounts, or both.

In a memo last year to the bank's board, the associate director laid out the consequences for the bank:

> Citibank was the first bank to close IBLL's account, citing the increased cost of doing business in non-presence countries. In 2013, Standard Chartered cited similar reasons for closing the bank's accounts. The bank shifted the majority of its U.S. dollar transactions to Commerzbank and Standard Bank, but in 2014, they also decided to close the dollar accounts of IBLL, citing the increased cost of compliance and the fear of U.S. regulatory action. Standalone banks like IBLL are increasingly unable to maintain correspondent banking relationships in U.S. dollars, which is leaving Liberia increasingly isolated and vulnerable.

Remittances from expatriate workers are another area of real concern, because many poor countries are so reliant on them. According to the World Bank, remittances this year will likely be three times the amount of official development assistance, reaching upwards of

According to the World Bank, remittances this year will likely be three times the amount of official development assistance, reaching upwards of $450 billion.

$450 billion. And the United States is, not surprisingly, the largest source of remittance funds globally. Transfers home make up about 20 to 30 percent of income in several of these countries and can range higher in conflict and post-conflict countries.

Indeed, recognizing the importance of these flows, the G20 made a formal commitment to reduce the transaction costs of remittances. But global banks are effectively undermining the effort by terminating their relationships with specialized money-transfer services in response to heightened regulation.

Affected parties are not legally entitled to some means of access to the global banking system, even if they can prove their hands are clean.

The banks' logic is unassailable: money-transfer businesses put them in significant jeopardy. They often don't or can't distinguish licit from illicit flows because they serve the world's poorest, least institutionally developed countries and because they are not subject to the same regulatory requirements as banks. All of this has come together in a kind of financial tsunami for Somalia, a country on the Treasury Department's Office of Foreign Asset Control's sanctions list, where illicit flows of all kinds are high – but where remittances, which represent a startling 50 percent of Somali income, are vital to many families' survival.

De-risking is hampering international private aid, peacekeeping and charity efforts for similar reasons. These organizations need to conduct business in the world's riskiest, most marginalized places. But it is increasingly difficult for even well-established global charities to access banking services in countries where they are needed most – for example, in Syria. Last October the Financial Action Task Force (FATF), the international body overseeing the rules of terrorist finance and anti-money laundering, acknowledged the collateral damage:

> What is not in line with the task force's standards is the wholesale cutting loose of entire classes of customer[s]. … The FATF expects financial institutions to identify, assess and understand their money-laundering and terrorist-financing risks and take commensurate measures in order to mitigate them. *This does not imply a "zero failure" approach. The FATF is committed to financial inclusion, and effective implementation of AML/CFT measures through proper implementation of the risk-based approach.* [Emphasis added.]

Affected parties are beginning to fight back as well. In Britain, Dahabshiil, Africa's biggest remittances provider, won an injunction against Barclays after Barclays tried to shut its account over anti-money-laundering and combating-the-financing-of-terrorism concerns. But the agreement was just a stay of execution; Barclays was only forced to give Dahabshiil a transition period in which to make other arrangements. Similarly, in Australia, 20 remittance firms joined in a lawsuit against Australia's WestPac Banking Corp. to prevent it from exiting the remittance business, arguing that such a move would cripple them. Affected parties lament, in particular, the fact that there is no mechanism through which to plead for a reversal of a bank's decision. They are not legally entitled to some means of access to the global banking system, even if they can prove their hands are clean.

Because banks tend to share risk-information sources and because they monitor each other's decisions, being dropped by one correspondent bank sharply increases the diffi-

culty of finding another. Worse, one expert relates, because global banks have closed their correspondent banking relationships in waves, “there is a kind of global gossip about which banks were dropped in which wave, with an assumption that if a bank was in the first wave it must be in the worst shape.”

It’s also worth noting that de-risking can boomerang, undermining intelligence-gathering and anti-money-laundering efforts. While it is true that forcing illicit flows out of the legitimate financial system has been the point of these efforts, the isolation of legitimate actors decreases the transparency and the integrity of the system, and its resistance to penetration by bad actors. A letter to shareholders from the International Bank (Liberia) Limited, for example, goes on to explain:

> U.S. businesses active in Liberia, which include the likes of Exxon and Chevron, now are unable to bank with a U.S.-owned bank in Liberia, and are instead forced to bank with one of the Nigerian-owned banks, many of which have severe governance issues, but which are able to maintain their international correspondent relationships by using their African banking franchises to move funds from Liberia to another country and then transmit [and] clear the funds in the U.S.

U.S. authorities are aware of these risks. The U.S. Treasury’s Financial Crimes Enforcement Network recently issued a statement to “reiterate expectations” regarding banking institutions’ obligations toward money-services businesses under the Bank Secrecy Act, couching it, in part, in counterterrorism terms.

> Currently, there is concern that banks are indiscriminately terminating the accounts of all MSBs, or refusing to open accounts for any MSBs, thereby eliminating them as a category of customers. … *Refusing financial services to an entire segment of the industry can lead to an overall reduction in financial sector transparency that is critical to making the sector resistant to the efforts of illicit actors.* [Emphasis added.]

A MIDDLE WAY?

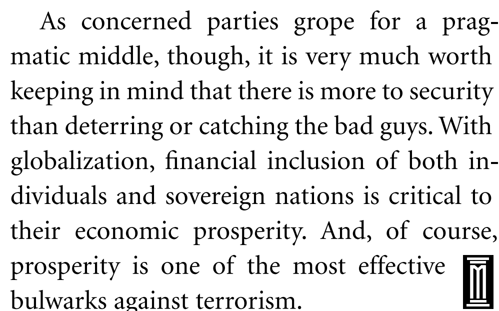
Banks argue that they are responsible to their shareholders to weigh the cost of compliance (high) against the business upside (low), and they don’t appreciate the problematic policing role that has been foisted upon them. Jaspal Bindra, head of Standard Chartered’s business in Asia, recently gave voice to that view, noting that when “we have a lapse we don’t get treated like a policeman, we are treated like a criminal.” For their part, U.S. authorities argue that banks are reading too much precedent into fines that were levied for egregious sanctions violations (and in the case of BNP Paribas, willful obstruction of justice).

* * *

The fundamental issue is one that’s well understood by economists: the benefits of the international financial system can’t be fully captured by the providers – and thus the system as a whole delivers less service than one would expect from an efficient market. Howard Mendelsohn, a former Acting Assistant Secretary of TFI, has outlined the broad contours of a practical way forward:

> Institutions must have confidence that they can take a reasonable, risk-based approach, have their defenses penetrated from time to time and not trigger a punitive regulatory response. The way forward lies in resetting the regulatory framework in a way that produces greater transparency and standardization and creates the incentives for sustainable investment to understand and manage risk.

As concerned parties grope for a pragmatic middle, though, it is very much worth keeping in mind that there is more to security than deterring or catching the bad guys. With globalization, financial inclusion of both individuals and sovereign nations is critical to their economic prosperity. And, of course, prosperity is one of the most effective bulwarks against terrorism.



Why Labor-Force Participation Shrank and What It Means

Nobody disagrees: The Great Recession and its aftermath wreaked havoc on the labor market.

As employment plummeted, the U.S. unemployment rate surged from under 5 percent in the months just prior to the start of the recession in December 2007 to a high of 10 percent in October 2009. Since the recession officially ended, the unemployment rate has slowly returned to more-normal levels, dropping to 5.5 percent in February 2015. There is continuing debate, however, about what the decline in that unemployment number really means – and how it should be viewed in the context of how to tell when the economy is likely to overheat.

for the American Economy

BY KATHARINE G. ABRAHAM

For even as the unemployment rate has fallen, a larger share of the total population has opted out of the labor force entirely, neither working nor actively looking for work and thus not counted as unemployed. Some of these people could well return to the workforce if sufficient demand for their services were to materialize. The more such people there are, the more misleading the unemployment rate is likely to be as an indicator of labor-market slack – and the more of a mistake it could be for policymakers to rely on the signal provided by unemployment in estimating by how much economic activity could expand in the short term without setting the stage for inflation.

WHO'S IN, WHO'S NOT

To provide some historical perspective, consider the figure on page 37, which shows the evolution of the labor-force participation rate from 1960 to the present, both overall and by gender. Women entered the labor market in unprecedented numbers beginning in the 1960s, driving up the share of the population in the labor force. But even as women were surging into the labor market, men were leaving, albeit at a slower pace.

Overall participation began to fall around the year 2000, reflecting both a leveling-off of women's participation and the ongoing slow decline of men's participation. The overall decline paused during the mid-2000s, but has since resumed – and picked up speed.

Labor-force participation tends to fall a bit, relative to its trend, when the economy is weak. But participation is not, in general, highly cyclical. The decline during the Great Recession was actually rather modest – it dropped just 0.3 percentage points between December 2007 and June 2009. But here's the surprise: it fell an additional 3.0 percentage points from the middle of 2009 through the end of 2014.

To put this decline in perspective, each percentage point decrease in labor-force participation translates into roughly a 1.6 percent decrease in GDP when the economy is operating near capacity. This means that, going forward, a labor-force participation rate that remained a full 3.3 percentage points lower than before the recession would translate into roughly $900 billion less output per year. And that output loss would increase with time as both productivity growth and population growth boosted the overall scale of economic activity. It thus matters a great deal whether the decline in labor-force participation of the past few years will persist or reverse at least in part as the economy strengthens.

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People who left the labor force or never entered it because they faced poor job prospects may have become sufficiently disengaged or suffered enough loss in technical skills that they are unlikely to return.

While the size of the recent drop in participation is striking, roughly half of it is the entirely predictable result of the fact that the population is getting older. Indeed, demographic realities virtually dictate continued reductions attributable to population aging.

Labor-force participation follows a clear life-cycle profile. It starts out low during the teenage and young-adult years, since many who could legally work are still in school. It rises to higher levels during the middle years of life and then falls again as retirement becomes an option. In the United States, the outsized Baby Boom cohort – the group born between 1946 and 1964 – contributed to the overall growth in participation from the mid-1960s through the mid-1980s as its members flowed into the workforce. Now, however, the Boomers are starting to retire. The leading edge of the cohort turned 60 in 2006 and, as more and more of them have crossed that threshold, overall participation has naturally begun to fall.

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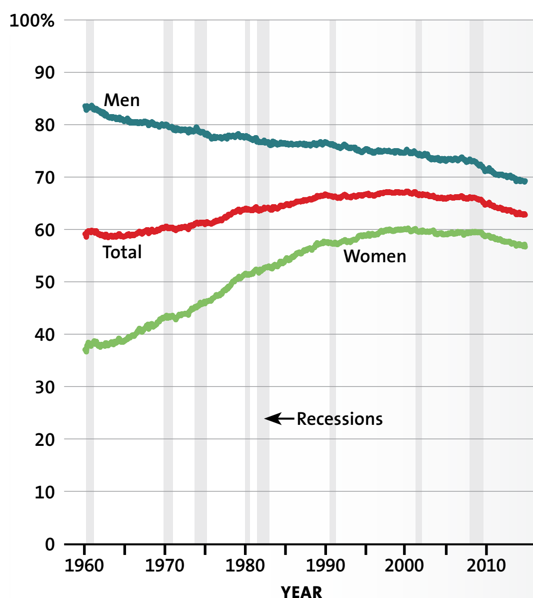
A simple way to estimate how the changing age distribution has affected overall labor-force participation since the start of the Great Recession is to calculate what would have happened had the participation rate within each of 24 age-sex groups remained at its 2007 level while the distribution of the population across these same groups changed as it actually did. This calculation implies that the structural effects of aging were responsible for a 1.8 percentage point decline in participation between 2007 and 2014. An alternative calculation looks at things the other way around, holding the distribution of the population across age and sex groups constant but allowing the labor-force participation rates within each group to change as actually occurred and then attributing the portion of the change that *can't* be explained by the within-group changes in participation to aging. This alternative estimate suggests that aging contributed 1.6 percentage points to the overall decline in participation, not that different from the 1.8 percentage point drop found by the first method.

Looking ahead, if participation rates within age-sex groups were fixed at their 2007 levels, the latest Census Bureau population projections imply that, by 2025, population aging will reduce overall participation by another 3 percentage points. That's about 0.3 percentage point per year on average over the next decade. The depressing effects of aging on participation will moderate after 2025, but can be expected to continue through 2035.

LABOR-FORCE PARTICIPATION RATES, 1960–2014



SOURCE: Author

WILL THEY COME BACK?

Against that backdrop, a big question looms: how much of the 1.4 to 1.6 percentage point decline in overall labor-force participation since 2007 that *isn't* due to population aging should be viewed as temporary – and potentially reversible if labor market conditions improve? Even before the start of the recession, labor-force participation rates for many age-sex groups had been trending downward. This suggests that some of the recent decline in participation not related to aging could reflect underlying structural factors. Further, there is a risk that some of whatever decline in participation is attributable to the recession rather than to structural trends could become permanent. That is, people who left the labor force or never entered it because they faced poor job prospects may have become sufficiently disengaged or suffered enough loss in human capital (technical skills) that they are unlikely to return.

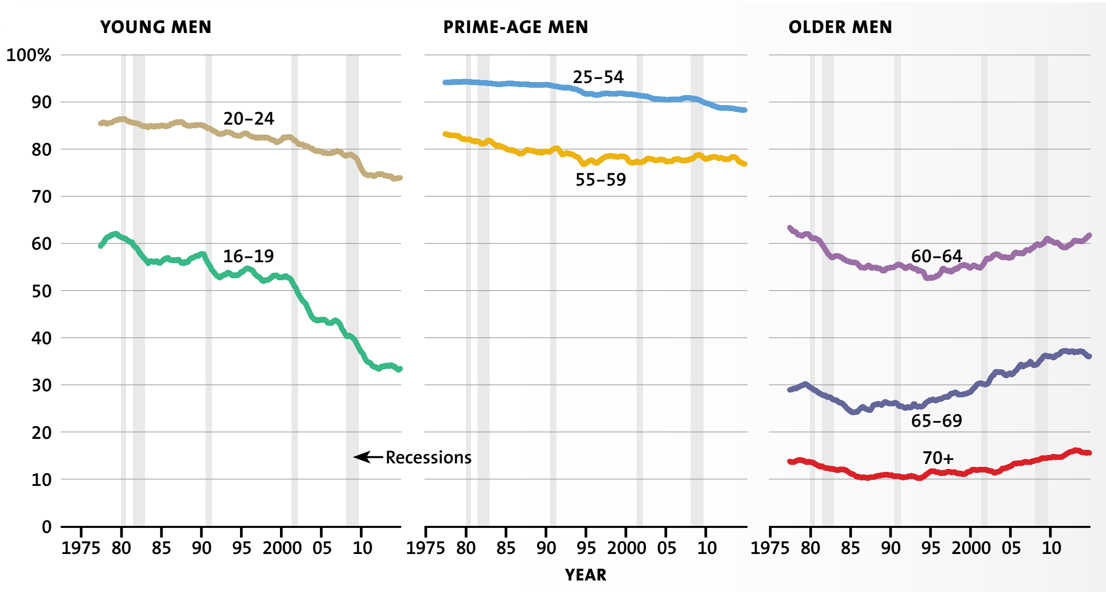
The figure on pages 38-39 shows how labor-force participation has changed since the mid-1970s for a number of age and sex groups – men and women aged 16 to 19 and 20 to 24, men and women aged 25 to 54 and 55 to 59, and men and women aged 60 to 64, 65 to 69 and 70-plus. Participation among

teenagers has declined especially sharply. But since about 2000, participation among both men and women aged 20 to 24 has also fallen. All told, changes in these two groups' participation rates account for a 0.9 percentage point drop in overall participation between 2007 and 2014.

Less-pronounced slides in labor-force participation among men aged 25 to 54 are also apparent in the figure, as are a leveling off and more recent decline in participation among women aged 25 to 54 and 55 to 59. From 2007 to 2014, the declines in participation affecting the five-year age groups in the 25-to-59 age range contributed about a 1.1 percentage point drop in overall participation.

Note, however, that for older Americans, the dynamic is running the other way. Participation has risen substantially, most especially among men and women in their 60s. Changes in participation in the 60-plus cohort have actually boosted overall participation by about four-tenths of a percentage point over the past seven years, though the increase could well have been larger had the economy been stronger.

Some of the long-run decline in participation among those aged 16 to 24 seems likely to be the result of increasing competition with low-wage older adults for scarce jobs, but most of it appears to be related to increasing investment in education. With the returns to education rising considerably, teens and young adults are significantly more likely to be enrolled in school than in the past. By 2007, school enrollment among 16- to 24-year-olds had reached 51.9 percent (averaged over the 12 months of the year) compared to just 36 percent in 1985. Enrollment rates rose yet further from 2007 through 2012, as the labor market faltered and was slow to recover its footing. But by 2014, enrollment had fallen back to 2007 levels. This implies



SOURCE: Author

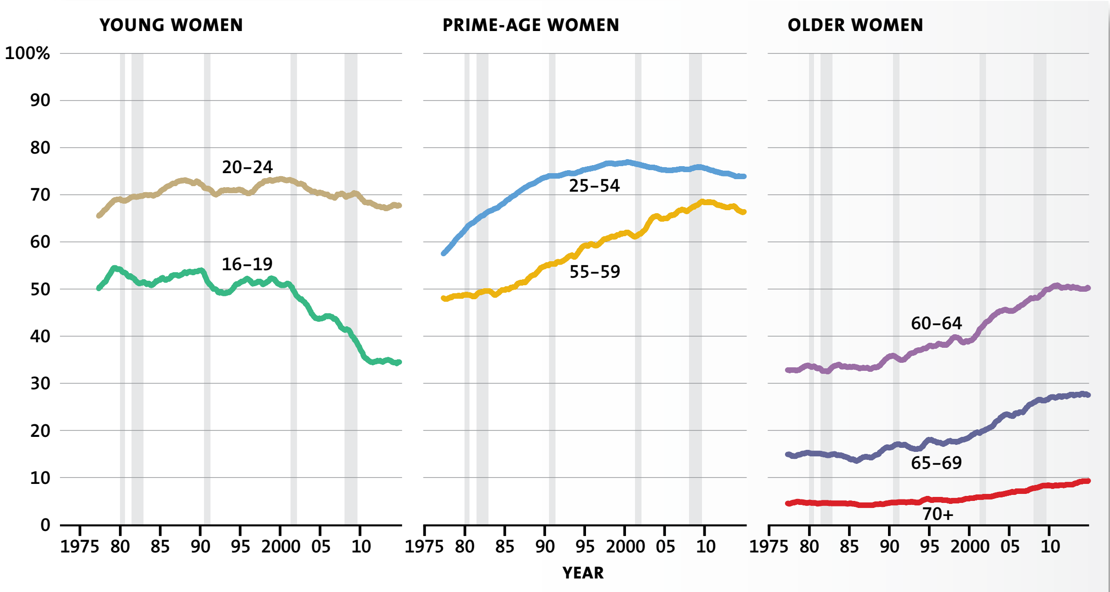
Much of the decline in labor-force participation among prime-age men reflects a deterioration of job opportunities for less-educated workers.

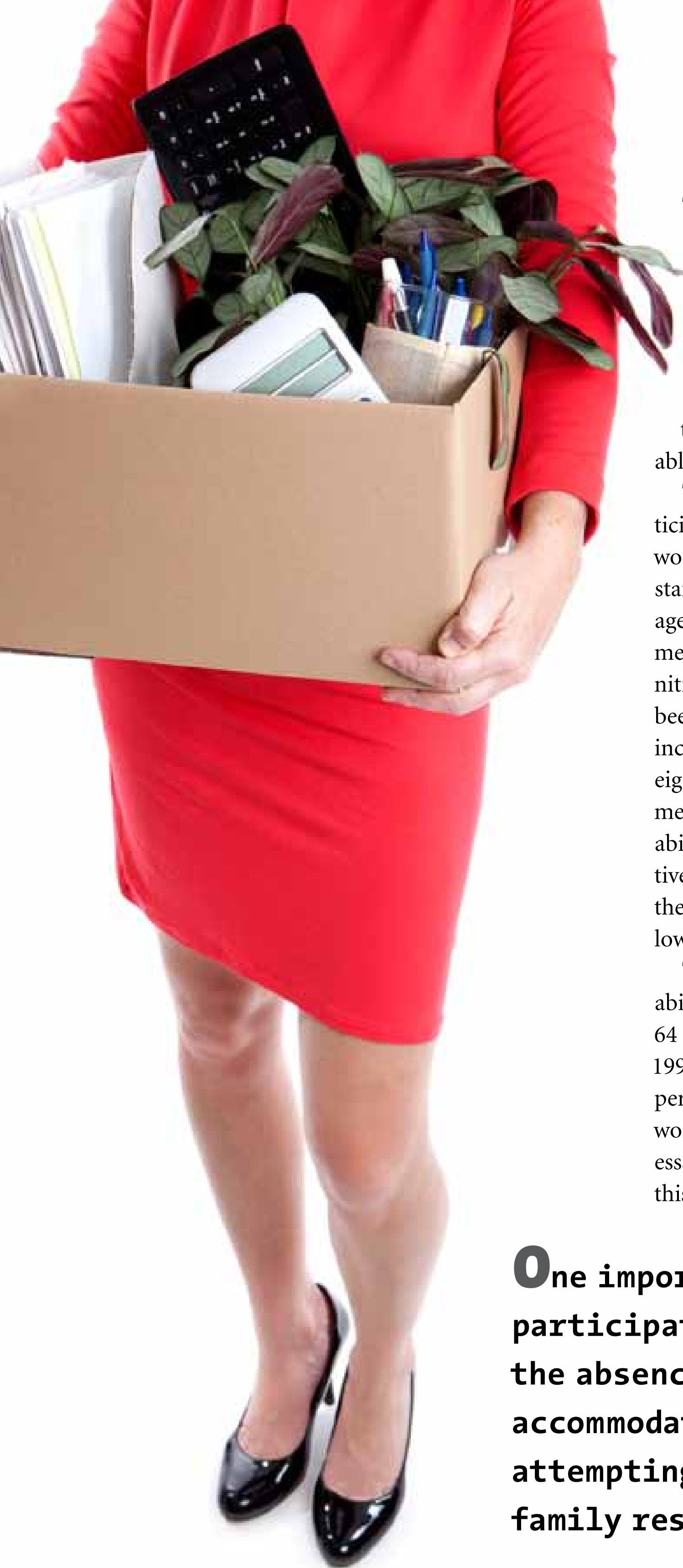
that changes in school enrollment cannot account for the net decline in youth participation since the start of the recession.

It is notable, however, that the decline in participation from 2007 through 2014 was concentrated among young people who are enrolled in school; while there also have been declines among those who are not enrolled, they have been much smaller. Part of the reason students are now less likely to be working (or trying to get jobs) may be that they are more focused on their studies. Unfortunately, data from the American Time Use Survey that allow us to see how students spend their time are only available beginning in 2003. But one study did find that, from 2003 to 2007 and 2008 to 2013, the average time per day spent on education-related activities rose by nearly 8 percent among high school students and 15 percent among college students.

Another way to look at the labor force and enrollment data is to track the share of those in the 16- to 24-year-old age group who are either in the labor force or in school. This combined figure is plotted in the figure on page 41 along with the conventional labor-force participation rate. While labor-force participation among those aged 16 to 24 has fallen by 4.4 percentage points since the recession began, the share who are either in the labor force or in school has fallen by just 1.1 percentage points.

FEMALE LABOR-FORCE PARTICIPATION RATES, 1977–2014





There would thus seem to be reasonable grounds for optimism about the long-term labor-market attachment of today's teenagers and young adults. While fewer of them are in the labor force at the moment, most of those who are not appear to be investing in education that should make them more employable later on.

The long-term decline in labor-force participation among prime-age men is more worrisome, as are the hints in the data of the start of a similar downward trend for prime-age women. Much of the decline among the men reflects a deterioration of job opportunities for less-educated workers, which has been driven by changes in technology and the increasing openness of the economy to foreign competition. For eligible lower-skilled men whose job opportunities are poor, disability benefits can offer an attractive alternative to remaining in the labor market – and the same seems to be increasingly true for lower-skilled women.

The ratio of male workers receiving disability benefits to the population aged 25 to 64 has risen from 3.2 percent in December 1990 to 4.8 percent in December 2007 and 5.7 percent in December 2014. In the past, fewer women had the years of work experience necessary to qualify for disability benefits. But as this has changed, disability-benefit receipt for

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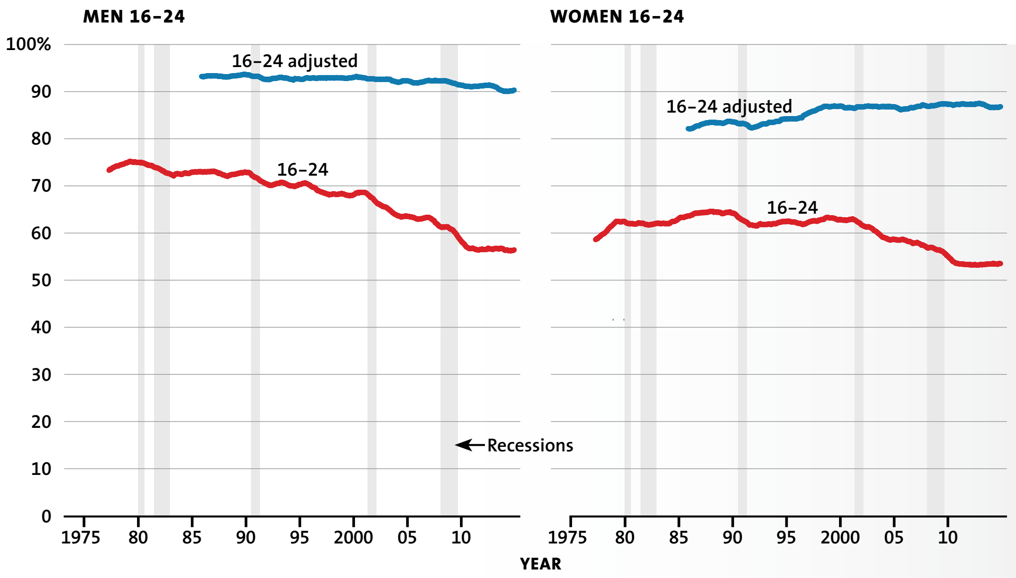
One important factor limiting participation among U.S. women: the absence of policies to accommodate mothers who are attempting to combine work with family responsibilities.

ADJUSTED LABOR FORCE PARTICIPATION RATE, 1985–2014



SOURCE: Author

women aged 25 to 64 has also grown, from 1.6 percent in December 1990 to 4.1 percent in December 2007 and 5.1 percent in December 2014. Disability-benefit receipt has always been higher at older ages and some of the observed increase in overall prevalence is due to the aging of the population within the 25-to-64-year age range. But disability-benefit receipt has increased substantially even after taking that into account.

Other factors may also be affecting labor-force participation among prime-age women. For many years, the share of such women active in the U.S. labor market exceeded that in most other developed countries. In recent years, however, female participation has stagnated here while continuing to grow elsewhere. One important factor limiting participation among U.S. women has been identified in recent research: the absence of policies to accommodate mothers who are attempting to combine work with family responsibilities – in particular, paid parental leave, flexibility in hours of work for working parents and publicly supported day care for young children, all of which are a given in many other rich countries.

The President's Council of Economic Advisers pointed out in a recent report that labor-force participation among prime-age women in the United States is now well below the levels in Canada, France, Germany, the Netherlands and Sweden – and only slightly higher than in Japan, where women's low participation has become a high-profile issue. It is difficult, however, to sort out the relative contributions of the different structural factors just mentioned from the weakness of the labor market in the years following the Great Recession.

Among older workers, things look quite different, as increasing numbers are remaining in the labor force rather than retiring. Several factors appear to be influencing that trend. First, changes in Social Security have made it more attractive for many people to continue working between ages 62 and 70.

They include:

• The phased increase in the normal retirement age from 65 to 67, which has had the effect of lowering benefit levels for those reaching age 62 in 2000 or later.

• The elimination of the earnings test for those past the normal retirement age, which has allowed them to keep working without losing a portion of their benefit checks.

• The phased increase in the generosity of the delayed retirement credit that raises monthly benefits for those who defer their first payments past the normal retirement age.

Changes in the private pension landscape have also played a role. Fewer of today's retirees are receiving traditional, annuity-like defined-benefit pensions that encourage retirement once the comfortable benefit level has been reached, while more have defined-contribution plans [401(k)s and the like] that reward additional years of work and do not guarantee that the benefits will last a lifetime. Further, with defined-benefit pension plans less common, many would-be retirees with only modest savings may feel they have no choice but to continue working.

Another important factor has been the increase in life expectancy at older ages. In 1980, then-current mortality rates predicted that the typical man who was 60 could expect to live another 17.3 years; by 2010, the average 60-year-old man could expect to live another 21.3 years. Improvements in overall health at older ages, along with shifts in the mix of employment away from physically demanding jobs, have likely reinforced the impact of increasing longevity.

While tracing out the broad factors that have affected labor-force participation among subgroups is straightforward, it is more difficult to draw firm conclusions about how much of the recent decline in overall participation is structural and how much is temporary and likely to be reversed. Population aging will push labor-force participation downward over the next decade, but a sufficiently large rebound in participation within age-sex subgroups over the next year or two could raise overall participation. The big question is whether this is likely to happen.

It is difficult to draw firm conclusions about how much of the recent decline in overall participation is structural and how much is temporary and likely to be reversed.

Assessments of the prospects for overall labor-force participation in the near term have varied considerably.

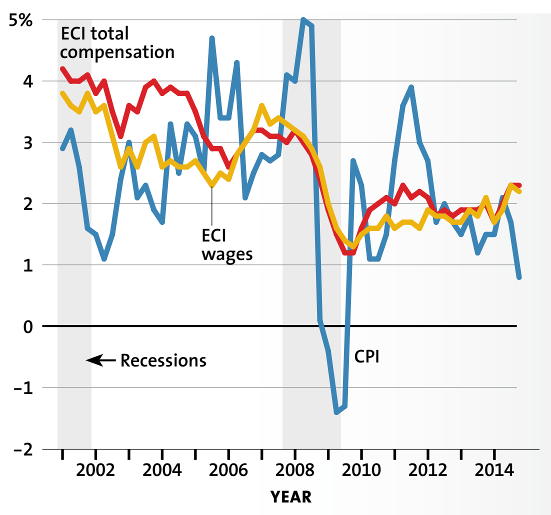
• At one end of the spectrum, a recent study by researchers from the Federal Reserve Board that modeled a variety of influences on participation – including factors affecting group-specific participation rates as well as the effects of population aging – estimated that only about a quarter of a percentage point of the decline in overall labor-force participation since 2007 is cyclical. While acknowledging some uncertainty in the estimates, the authors of this study attributed most of the recent non-aging-related decline to fundamental drivers not linked to the recession, suggesting that the bulk of it is likely to persist.

• Taking a less pessimistic stance, a paper by researchers from the Federal Reserve Bank of Chicago concluded that up to 1.2 percentage points of the recent decline in overall par-

ticipation could be reversed as the labor force returns to its underlying trend level, with about four-tenths of a percentage point of that total representing a normal cyclical rebound and about eight-tenths of a percentage point representing recovery from the unusual impact of the Great Recession.

• Yet another report, released last year by the Congressional Budget Office, concluded that roughly one percentage point of the non-aging-related decline in labor-force participation from the end of 2007 through the end of 2013 was likely to be transitory, with another five-tenths of a percentage point a more permanent reduction attributable to scarring associated with the Great Recession.

TOTAL COMPENSATION, WAGES AND CONSUMER PRICES, 12 MONTH PERCENT CHANGES, 2001–2014



SOURCE: Author

WHERE THE RUBBER MEETS THE ROAD

While any assessment of the prospects for recovery of participation must be interpreted in the context of the ongoing negative trend generated by population aging, the different estimates nonetheless imply quite different conclusions about how much slack currently exists in the labor market. Which of them proves accurate matters a great deal for the policy decisions the Federal Reserve is facing.

If interest rates are kept low and anticipated increases in labor-force participation do not materialize to augment the supply of labor, there is a risk that the economy could begin to overheat. On the other hand, if interest rates are raised sooner rather than later, demand may be insufficient to draw all of the potentially available workers back into the labor market, leading to less output and lower employment than a more-accommodative monetary policy could have produced.

Speaking for myself, in light of the trade-off that is presenting itself – a trade-off between the risk of some extra inflation and the risk that many people who would like to work won't have jobs – I'm definitely inclined to accept the inflation risk. The hardships that long-term joblessness impose are so well documented that I find it difficult to come to any different conclusion.

Still, while it's clear to me that the inflation risk is worth taking, there needs to be some empirical basis for deciding when monetary policy should tighten. Given the disagreement already described about how to interpret the recent decline in the labor-force participation rate, along with related disagreements over how low an unemployment rate is sustainable without triggering inflation, these statistics seem unlikely to provide an unambiguous signal.

In view of the difficulty of parsing the data to gauge how much slack remains in the labor market, it would make a lot of sense to rely more heavily on data on wages to guide monetary policy decisions. After all, the main reason to be concerned about maintaining a monetary-policy stance that is too accommodating is the risk that it will tighten the labor

market too much, putting upward pressure on what employers must pay and generating upward pressure on prices.

That channel, fortunately, is something that can be monitored directly with Employment Cost Index (ECI) data produced by the Bureau of Labor Statistics. In contrast to average wages, which omit the cost of employee benefits and might go up or down because the occupational mix of employment is changing, the ECI data track what employers are paying for labor, holding constant the mix of jobs performed.

Year-over-year percentage changes in the ECI series for total compensation in the private sector are shown on page 43, along with year-over-year changes in the ECI series for private sector wages and in the Consumer Price Index. As can be seen in the figure, year-over-year nominal compensation growth fell in the latter half of 2009 and, after a partial recovery, has subsequently remained relatively flat; wages have behaved similarly.

Growth in compensation and in wages exceeded the growth in prices from the end of 2008 through the end of 2009, but this was due entirely to a sharp decline in inflation. Since that time, real compensation and real wages have risen only slightly. Indeed, the cumulative growth in compensation exceeded the cumulative growth in consumer prices by just 2.2 percentage points over the five years from the fourth quarter of 2009 through the fourth quarter of 2014. This is only about half the rate of growth in labor productivity over the same period, implying that labor costs per unit of output are actually falling.

Even if wages did not begin to outpace productivity growth until after the economy had reached full employment and there was some overshooting as a result, a period in which the demand for labor exceeded the readily available supply would not necessarily be a bad thing. In fact, creating surplus job opportunities could be the best possible way to get people who have given up on the labor market or have been written off as unemployable back into the labor force.

While it is hard to be sure what would happen if such a situation could be engineered, the experience of the very tight labor market of the late 1990s is instructive. Following the major change of the welfare system introduced in the mid-1990s, large numbers of relatively uneducated women were able to move from the welfare rolls into employment. Research shows that their success was due largely to the robust labor market conditions prevailing at the time. Today, there are concerns about declining labor-force participation among less-educated men and women. A strong economy could well do more than just about anything else to reintegrate them into the workforce.

Looking further into the future, population aging will exert a continuing influence on labor-force participation.

Once any possible short-term increase related to the economic recovery has been realized, we can expect a return to the longer term slide in participation, leading to slower economic growth and affecting households, businesses and governments. Faced with this new environment, it is possible that employers competing to recruit from a less-abundant labor pool will bid up wages, offer more family-friendly work arrangements or make other accommodations that entice more people to enter the labor force.

Government could play a role here, too, by lowering barriers that may be keeping people from looking for work.

One deterrent to employment that is especially relevant to low-wage households is the effective marginal tax rate faced by second earners in such households. As described in a

Defining the Stats

In the United States, measures of labor-force activity for the population aged 16 and older are based on the monthly Current Population Survey conducted by the Census Bureau for the Bureau of Labor Statistics. The survey is designed to be representative of the civilian population resident in the United States; the labor-force questions are asked only of those aged 16 and older. A survey respondent who did any work for pay or profit during the survey reference week or who is temporarily absent from a job is counted as employed. To be counted as unemployed, a person must not only be available for work but also generally must have searched for work within the prior four weeks. The labor force consists of those who are either employed or unemployed. Anyone else is considered to be out of the labor force.

The unemployment rate is equal to the total number unemployed divided by the number in the labor force (employed plus unemployed). The labor-force participation rate is equal to the number of people in the labor force divided by the population aged 16 and older.

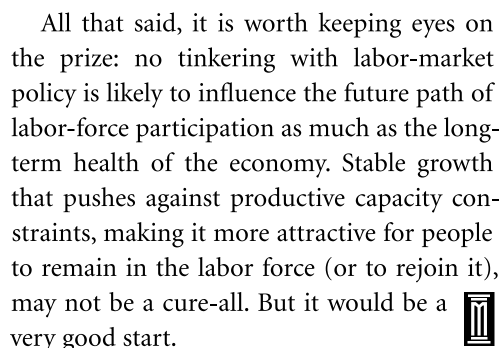
recent Hamilton Project report, in a married-couple household in which the first earner is paid $25,000 and the second earner could also earn $25,000 if he or she chose to work, the effective marginal tax rate on the extra income could be as high as 70 percent when one takes account forgone Earned Income Tax Credit payments, increased federal income and payroll taxes, the loss of food stamp eligibility and extra child care costs. One policy change that could help to overcome this barrier to labor-force participation would be a tax credit for second earners, an idea incorporated in President Obama's proposed 2016 federal budget.

Another initiative that could help keep women with children in the labor force would be to make paid family leave more widely available. As already noted, paid leave is common in other developed countries. In 2002, California passed legislation to create a paid leave program financed by a tax on employers, and over the past decade three other states have followed suit. While the California program is modest in scope compared to paid leave programs in other countries, research suggests that it has kept some new mothers attached to the labor market, and it could be a useful model for federal legislation.

Last but not least, it's worth noting how immigration policy fits in here. Since immigrants are more likely than the native born to be in their early working years, liberalization of immigration policy would likely affect the age distribution of the population and thereby increase the labor-force participation rate.

* * *

All that said, it is worth keeping eyes on the prize: no tinkering with labor-market policy is likely to influence the future path of labor-force participation as much as the long-term health of the economy. Stable growth that pushes against productive capacity constraints, making it more attractive for people to remain in the labor force (or to rejoin it), may not be a cure-all. But it would be a very good start.



Japan's Debt Dilemma

Is Generational Conflict Avoidable?

BY NOAH SMITH

I had only one conversation with Gary Saxonhouse, an eminent American scholar of the Japanese economy, before his death in 2007. And I only got a chance him to ask one question: "What's Japan's biggest economic problem?"

"The debt, of course," he answered without hesitation. And it's hard to imagine that he would have changed his mind since then. Today, the Japanese government's debt is an eye-popping 238 percent of GDP.

That number would instinctively worry most people. By comparison, after years of running humungous budget deficits to offset sagging private demand during the Great Recession, the public debt of the United States is "just" 101 percent of GDP. But was Saxonhouse right? Is Japan's debt as crushing a burden as it seems?

UNHAPPY FAMILIES

Not all public debts, we should remember, are alike. Japan's debt, unlike that of, say, Greece or Argentina, is almost entirely domestically held. The mountain of liabilities thus represents the government's promises to various groups of Japanese people – individual bondholders, banks, corporations, pension funds and the Bank of Japan (Japan's equivalent of the Federal Reserve). If the debt carried no interest, the government could simply decide never to pay it back – rolling over each bond as it matured without harm to the economy.

But that simple it is not. First of all, the interest rate on the debt is not zero. Thus, even with Japan's low, low interest rates, servicing it means that more than 15 percent of government revenue must go toward interest payments. That revenue has to be extracted from the Japanese people through taxation, which distorts market incentives of all sorts and lowers GDP. Think of those interest obligations as a leaky pipe that circulates money from some Japanese to others, losing some into the ground along the way.

Second, managing such a large heap of debt incurs interest-rate risk. If rates ever rose sharply, required interest payments would eventually increase until they swamped the budget – the leaky pipe would burst. In order to prevent this from happening, the government must lean on the central bank to keep interest rates low in order to stay solvent – circumstances that economists call fiscal dominance. Standard economic theory says that could lead to out-of-control inflation, were the economic growth to accelerate.

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Third, the debt mountain is still growing. If the debt-to-GDP ratio keeps rising without bounds, at some point the public could lose confidence in the government's ability to make future interest payments. If this fiscal limit were reached, interest rates would spike, leading to an immediate default. No one, by the way, has a clue to where the fiscal limit lies. It's only common sense that the higher the debt-to-GDP ratio goes, the greater the danger of bumping into the wall. But just how much greater is something that no one can really calculate. A major hedge fund manager, Kyle Bass, and others have loudly predicted a Japanese debt disaster for many years. So far they haven't been right, of course

So how bad would a sovereign default be? In the long run, it might not actually be so bad. After all, countries that default tend to experience a burst of growth after the pain of the first year. More specifically, sovereign default might lead to a cleansing of Japan's stable of unproductive companies that own much of the official paper – just what the country needs, perhaps.

Japan rose from the ashes of World War II; might it rise once again? Perhaps. But even with luck and skillful crisis management, the collateral damage would surely be great, and the risk that all would not end well would be high. No country of comparable economic output, wealth or geopolitical importance has ever defaulted in time of peace. Every Japanese bank, financial company, insurer and pension fund would become insolvent overnight.

The financial system would implode. Deprived of loans, a huge number of Japanese companies – among them, many that are productive and well managed, would be thrown into bankruptcy. Unemployment would skyrocket and gross investment would grind to a halt. The Japanese government would probably be forced to print money to pay unem-

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REUTERS/YUYA SHINO

Sovereign default might lead to a cleansing of Japan's stable of unproductive companies that own much of the official paper – just what the country needs, perhaps.

ployment benefits and to keep floundering firms going. Japanese exporters would lose their international competitive position, and in this take-no-prisoners global economy would have a great deal of difficulty recovering it. The yen would collapse, and the country would have trouble paying for food and energy, most of which is imported. In short, debt default would lead to chaos.

Japan's political system is notoriously weak and an economic collapse would sweep away the regime that has been in place since 1945. What would replace it is anyone's guess, but historical experience and recent political rumblings suggest that it would be a deeply illiberal right-wing government. Just how China, Japan's wary global economic partner and rival, would react is anybody's guess.

NUCLEAR AND OTHER OPTIONS

If a clean-sweep default is implausible, what could be done to reduce the danger of default of any sort and to reduce the deepening distortions created by the government's ever-growing burden of interest payments? The fact that both the Japanese and foreigners continue to buy government bonds at historically low interest rates suggests that most believe pretty strongly there are ways to avoid to default. In fact, there are several things that

could be done to manage the problem. But all of them involve some element of wealth redistribution, and so all of them would be difficult in political terms.

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The most obvious would be to raise taxes – indeed, tax hikes have figured in Japanese government plans for decades. But the tax approach would not be for the fainthearted. A number of economists have tackled the question of how much Japan would have to raise taxes in order to put its debt-to-GDP level on a stable long-term path. Two economists, Gary Hansen and Selahattin Imrohoroglu, took a crack at the calculation in 2013, and the results were not encouraging. They concluded that the tax take would have to be somewhere between 40 and 60 percent of GDP– rates almost unimaginable in a functioning market economy.

A 2011 paper by three other economists, Takero Doi, Takeo Hoshi and Tatsuyoshi Okimoto, came up with a figure of between 40 and 47 percent of GDP – near the lower end of Hansen and Imrohoroglu's numbers. But their estimate is already outdated, since the debt has been increasing steadily in the interim.

Note also that these estimates are almost certainly on the optimistic side, since they abstract from Keynesian demand-side effects. An ill-timed hike in Japan's broad-based consumption tax last year was widely blamed for pushing GDP growth back into negative territory, leading the government to postpone a planned hike this year. And even if a government were brave enough (and foolish enough) to try to tax its way out of deficits in a period of slow to no growth, it's self-evident that taxes would have to be raised even more than the economists calculate from supply-side effects alone.

But forget the demand side for a moment. Tax collection at the rates implied by the Hansen-Imrohoroglu analysis would be unprecedented outside wartime. The highest-tax countries in the world today, Sweden and

Denmark, garnish less than 45 percent of their GDP in taxes – and use the revenue to provide benefits appreciated by taxpayers. Japan currently takes in about 28 percent of GDP, so taming the debt would require an increase in taxes of between 12 and 32 percentage points that would do nothing to improve the lot of Japanese families. The aforementioned 2014 consumption-tax hike, which raised the tax from 5 percent to 8 percent, prompted popular outrage – and had in fact been delayed for many years due to its unpopularity.

So raising taxes would at best be only part of the solution to the debt problem. What about cutting spending?

I still remember cheering in the early 2000s as Japanese Prime Minister Junichiro Koizumi took an axe to the wasteful public works outlays that had been responsible for much of the run-up in debt during the 1990s. That splurge of "investment" was probably motivated less by economics and more by the patronage system that the political scientist Ethan Scheiner calls "clientelism." The flood of government money paved over riverbeds and turned parks into parking lots. And I've personally driven over one of Japan's fabled "bridges to nowhere," built to make work for favored constituents. But the outlays failed to provide much of a lasting boost to the economy. When Koizumi finally cut off the tap, a huge source of national waste was eliminated.

This did not, however, plug the gaping budget hole, because demographic factors kicked in. Even as public-works spending was cut back, Japan's population peaked and went into decline. Meanwhile, the Baby Boom generation began to retire, leaving ever-fewer workers to support each retiree. That reality is reflected in the ongoing increase in the government's pension and health care obligations – spending that cannot easily be cut without impoverishing a large number of aging citizens. In any case, such cuts are not in the cards because older people in Japan (like older people in the United States) vote in large numbers and (unlike many of their American counterparts) are not easily distracted from bread-and-butter issues.

Japan's aging population has forced it to adopt super-Scandinavian levels of social spending. If raising taxes to super-Scandinavian levels is out of the question, then it's going to be very, very hard to bring deficits under control.

To put it simply, Japan's aging population has forced it to adopt super-Scandinavian levels of social spending. If raising taxes to super-Scandinavian levels is out of the question, then it's going to be very, very hard to bring deficits under control.

Of course, the best option would be for Japan to grow out of its debt. And here, there's a glimmer of hope. Japan's productivity essentially stopped rising in 1990, even in its vaunted manufacturing industries. Since then, only small gains have been recorded. This productivity stagnation can be seen in the erosion of Japan's export competitiveness, in declining wages, and in the failure of Japan's GDP per capita to catch up to anywhere near that of the United States. Indeed, calculated in terms of purchasing power, Japan's GDP per capita is less than that of Taiwan or Ireland

and only a smidge greater than that of Israel.

Ironically, that offers grounds for optimism, since it means productivity has room to rise. Many of the structural reforms that Prime Minister Shinzo Abe is now either enacting or pushing for would unleash the power of neoliberalism – flexible labor markets, free trade and shareholder capitalism – on the stodgy, moribund Japanese corporate culture. That will surely disrupt Japanese society, but should ultimately give Japan a burst of growth in income and tax revenue that, other things being equal, would both shrink the numerator and boost the denominator of the debt-to-GDP ratio.

Other things are not equal, unfortunately. More income per person is of limited help when it comes to closing the deficit if you have fewer and fewer people. And here we come back to Japan's relentless population decline. Although the country's total fertility rate – the number of children an average woman is likely to bear – has ticked up in recent years, it still stands at only 1.4, far below the replacement level of 2.1. That means Japan's native-born population will continue to fall for decades, even if fertility magically recovered.

What about immigration? Not likely, because Japan, unlike the United States or Canada, defines itself ethnically. And even if the barriers to immigration could be lifted, a surge large enough to reverse the population decline and bail out the government's debt problem would likely cause a backlash that would make the United States' anti-immigration movement look tame.

WHATEVER IT TAKES

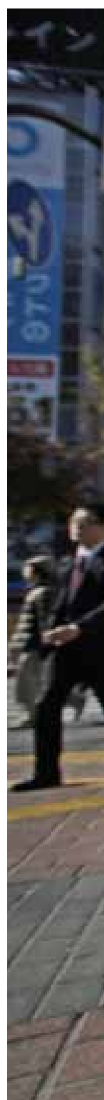
So if Japan is not going to be able to tax, reduce spending, or grow its way out of the debt trap, that leaves one option. It's time to talk about debt monetization – about using monetary policy to pay off debt.

The simplest and most well-tested form of debt monetization is the one Japan is already using: fiscal dominance. The Bank of Japan's vow to do whatever it takes to raise inflation from nil into the 2 percent range effectively means buying up financial assets wherever it can find them and pushing down interest rates on all sorts of debt to historic lows.

This strategy works well when paired with another technique: financial repression – the policy of leaning on banks and funds to buy government bonds no matter how low the interest rate goes. (Of course, this policy has the drawback of reducing bank funds available for loans to productive enterprises.) But in Japan, there are signs that the government's ability to bully banks and companies into buying its bonds is ebbing. Nor can Japanese households pick up the slack. The once-vaunted savings rate of the Japanese household has now fallen below that of the United States, thanks in large part to the ballooning numbers of retirees.

Who does that leave to buy the Japanese government's bonds? The Bank of Japan. The more dramatic version of debt monetization – the nuclear option, if you will – is to have the bank buy bonds directly from the government as it issues them. Japan's government actually did this from 1931 to 1936, as a strategy for combating the Great Depression. It worked then and it might work now.

In fact, if you are willing to go to the nuclear option of true debt monetization, you could also pay down the existing stock of debt. For starters, the Bank of Japan could cancel the debt that the government already owes it. This is the approach recommended by Adair Turner, former head of Britain's Financial Services Agency. Second, much of the Japanese government's debt is held by pension



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Young Japanese people are carrying the older generation on their backs, and it is breaking them.

funds that are run by the federal government. This debt could be swapped for cash created by the central bank, allowing the government to write down huge quantities of debt.

The numbers involved are staggering. Analyses by Columbia economist David Weinstein, and a Jobu University economist Hidetomi Tanaka suggest that anywhere from two-thirds to five-sixths of Japan's government debt is held by various government-owned pension funds and corporations, or by the Bank of Japan. Monetizing that debt would vaporize Japan's debt problem.

There is, however, a great danger here: it might also vaporize Japan's currency. If the government gives itself permission to get rid

of any amount of debt by monetizing it, it would have potent incentives to borrow and then shed the burden by converting the debt to cash. Realizing that, people and companies would likely become unwilling to hold yen because its value would be vulnerable to the indiscipline of the government. That way lies hyperinflation.

Of course, no one knows how much debt would have to be monetized to trigger hyperinflation, just as no one knows how high the debt-to-GDP ratio can go before bond buyers rebel. Either way, Japan is navigating uncharted waters.

So to recap: Japan could raise taxes to punishing levels or slash benefits to older people. It could continue to create money at a rapid clip to hold down interest rates. Or it could go a step further and create enough money to pay down much of the stock of Japan's debt and to finance government deficits directly. The path of least resistance, it seems, is to opt for some combination of these methods.

But notice something interesting about the menu of options for taming the debt monster. The only one that doesn't amount to a disguised tax on Japan's aging is the tax hike.

Remember, Japan's debt represents money that the Japanese government owes to Japanese people. The people who are owed that money are the older generations – mostly the Baby Boomers who enjoyed the fruits of Japan's long period of growth from the 1960s through the 1980s. These people had secure, well-paying jobs, along with a strong inclination to save for rainy days. And they stashed much of their wealth, either directly or indirectly, in government bonds.

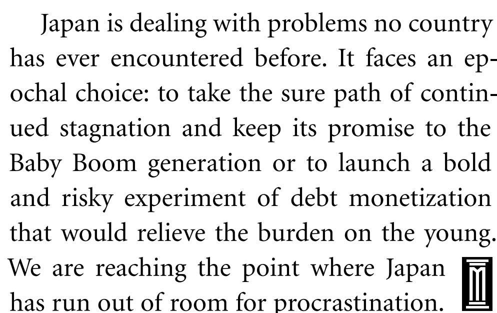
The Japanese government now faces a choice. It could make good on its commitments to that generation by exacting tribute from younger generations through taxes – and harming the economy in the process. Or it could confiscate some of the wealth of that older generation through debt monetization, risking out-of-control inflation.

Remember, too, that Japan's Baby Boomers outnumber the young and can be counted on to vote for their own interests. To put it another way, Japan is effectively a gerontocracy. Hence, there will be massive pressure on the government to hike taxes to stabilize the debt. But that would impose a new burden on Japan's young, who already face declining wages. They are responding by failing to get married or to have children, thus perpetuating Japan's demographic decline. In short, young Japanese people are carrying the older generation on their backs, and it is breaking them.

The option of monetization, by contrast, would not only erode the debt mountain but also brighten the economic situation of the beleaguered younger generation. Yes, the approach would generate inflation, but some inflation would be good for Japan right now. Hyperinflation is, of course, a risk, but this risk could be managed, for example, by increasing bank-reserve requirements if inflation seems to be spiraling up. Meanwhile, cuts in government pension benefits – another confiscation of the wealth of the old to relieve the burdens of the young – could help close the budget deficit.

* * *

Japan is dealing with problems no country has ever encountered before. It faces an epochal choice: to take the sure path of continued stagnation and keep its promise to the Baby Boom generation or to launch a bold and risky experiment of debt monetization that would relieve the burden on the young. We are reaching the point where Japan has run out of room for procrastination.



Climate Shock

BY GERNOT WAGNER AND
MARTIN L. WEITZMAN

*Climate Shock: The Economic Consequences of a Hotter Planet** is the last word (at least for now) on this increasingly alarming subject. No surprise there. Gernot Wagner is the lead senior economist for the Environmental Defense Fund and a former editorial writer for the *Financial Times*. Martin Weitzman, a professor at Harvard, has been at the forefront of environmental economics research for the past two decades. (Before that, he dazzled with a remarkably original framework for conquering stagflation, the economic catastrophe du jour in the 1970s and 1980s.) ¶ The chapter adapted here is on geoengineering – proposals for quarantining carbon dioxide emissions or altering the atmosphere to reduce the penetration of sunlight. Once thought the stuff of science fiction (check out *The Mars Trilogy* by Kim Stanley Robinson), geoengineering may be the last, best hope for containing global warming in a world that cannot seem to get its act together on the climate front. Wagner and Weitzman offer an accessible, clear-eyed analysis of the subject that will immunize readers from the Chicken Littles, conspiracy theorists and snake oil salesmen who tend to dominate the nascent debate over the benefits and costs of engineering away the impact of greenhouse emissions. — *Peter Passell*

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In June 1991 and with a year to go, preparations for the Rio Earth Summit were in full swing. "Sustainability" was in vogue.

Who could disagree that humanity ought to "ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs"?

The excitement was palpable. It might still be possible to achieve sustainable development "by the year 2000 and beyond," as the UN General Assembly had called for. There was only one problem: the Earth's atmosphere had already warmed by more than 0.5°C (0.9°F) since the Industrial Revolution, with all trends pointing higher still.

China had just emerged from a decade of market-based economic reforms and was on the cusp of pulling hundreds of millions of its citizens out of abject poverty. The best technologies available at the time meant that China would spend the next decade largely duplicating what the United States, Europe and others had done: burn coal, oil and natural gas – mostly coal – and dump the resulting carbon dioxide into the air, further heating the planet. There was only so much President George H. W. Bush could do by signing the 1992 Earth Summit declaration "Agenda 21," other than give heartburn and a rallying cry to future generations of right-wing conspiracy theorists. But all that was still a year out. President Bush and over a hundred fellow heads of state would not fly to Rio until June 1992.

Meanwhile, Mount Pinatubo, a volcano in the Philippines that had been dormant for over 400 years, began to rumble on April 2, 1991. Two months later, volcanic activity went into overdrive, culminating in a final explosion on June 15. Ash, rocks and lava buried the surrounding area. To make things worse, Typhoon Yunya slammed the area that very same day. The resulting floods, combined with the effects of the explosion, displaced more than 200,000 Filipinos; more than 300 died.

The costs were all too real. But so were the benefits: as a direct result of the volcanic eruption, global temperatures temporarily decreased by about 0.5°C (0.9°F), wiping out the entire temperature effects of human-caused global warming up to that point. The reduction in temperatures hit its peak just around the time of the Rio Earth Summit a year later.

Mount Pinatubo did all that by spewing some 20 million tons of sulfur dioxide into the stratosphere. That amount counteracted the global warming effect of around 585 billion tons of carbon dioxide that humans had managed to put into the atmosphere by then. (Now, more than two decades later, the total tonnage of carbon dioxide added to the atmosphere is around 940 billion, and still climbing.)

The leverage ratio of sulfur to carbon dioxide in terms of what's called "geoengineering" is enormous. The sulfur dioxide released by Mount Pinatubo reduced temperatures by about the same amount as 30,000 times as much carbon dioxide increased them. It's tempting to draw a link to nuclear technology: Little Boy, the atomic bomb dropped over Hiroshima, had roughly 5,000 times as much power as the same mass of traditional explosives.

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The comparison to nuclear technology also suggests the possible path ahead. The Titan II intercontinental ballistic missile was developed just 15 years after Little Boy was dropped. It could carry a warhead with more explosive power than all the bombs dropped in World War II combined, including Little Boy. If geoengineering advanced even a fraction as quickly, it's hard to imagine the technologies that could become available to counteract atmospheric warming by carbon dioxide. Even using today's technology, a more targeted geoengineering intervention could possibly achieve leverage ratios near a million-to-one – that is, 1 ton of cooling material could offset the warming caused by one million tons of carbon dioxide.

The similarities to the leverage of nuclear bombs are striking. But there's an important difference: both nuclear and conventional explosives destroy, whereas geoengineering has the potential to do immense good.

Both nuclear and conventional explosives destroy, whereas geoengineering has the potential to do immense good.

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THE PROMISE AND PROBLEMS OF GEOENGINEERING

Without considering the costs and lives lost, Mount Pinatubo's effect on global temperature was presumably a good thing. If we could wipe out two centuries of accumulated, human-caused global warming by turning a knob, why not go for it?

There are a few problems with that simple picture. Mount Pinatubo decreased the indirect, if all-too-real, effects of carbon dioxide in the atmosphere: the 20 million tons of sulfur dioxide created a sunshade that dimmed the radiation from the sun by about 2 to 3 percent throughout the following year. But the eruption did nothing to counteract the direct effects of carbon pollution, like turning the oceans more acidic as they absorbed added carbon dioxide.

Moreover, as much as participants in the 1992 Earth Summit were presumably heartened by the cooling impact of Mount Pinatubo, they must have been distraught by the accompanying decrease in stratospheric ozone that protects us from ultraviolet light. Combine the volcano's sulfur dioxide and other gunk with certain types of pollution that we humans send into the atmosphere, and you may get ozone depletion of the type that gave us the ozone hole over the South Pole – but now the depletion could occur over the tropics as well.

If that weren't enough, Mount Pinatubo is also invariably blamed for weather extremes – flooding along the Mississippi River in 1993 and for droughts elsewhere. The volcanic eruption coincided with the beginning of a global dry spell lasting about a year. Direct links are difficult to establish, but that only makes it more problematic. If we could draw a direct line from Mount Pinatubo to sub-Saharan African droughts, we'd at least know what to hold responsible. Without that link, speculation runs rampant.

What if, instead of a volcano, the cause of the climate change had been a group of scientists launching an experiment to counteract two centuries of global warming just in time for the Rio Earth Summit?

One can assume that such an experiment could have been designed in a way to avoid the 200,000 evacuations and 300 deaths. But even without those all-too-direct effects of the eruption, it would have been hard to imagine a university's institutional review board, the group charged with overseeing the safety of research, approving the experiment. It's often hard enough to get approval for a simple e-mail survey, asking test subjects to deploy their computer mice and answer a few benign questions. Now imagine intentionally injecting the stratosphere with tiny, custom-designed particles to mimic the effects of Mount Pinatubo, with the express purpose of altering the global climate.

Forget institutional review boards. The public might have a word or two to say here – as it should. Even if the only effect of releasing particles into the atmosphere were to cool the atmosphere with no regional difference whatsoever – an implausible outcome – it would still be hard to agree on the "right" amount of temperature lowering.

If you live at higher latitudes, a few degrees of warming might not be all that bad for you personally. Why dial that back? On the other hand, if you live in Cape Town, San Francisco or along the Mediterranean, you pretty much enjoy the most stable, ideal climate anywhere on Earth. Why change that?

And if we did dial it back, where should we stop? Pre-industrial levels seem like a reasonable target. But today seems fine, too.

There is no right answer to any of these questions, other than to say that we would need strong, global institutions and well-formed governance processes to make these decisions in a way that considers a breadth of voices in a democratic, well-informed way.

But we don't have a global government. Instead, we need to work with what we have. That's a fragmented global governance complex with imperfect representation and even more imperfect decision processes. Decision making in Washington, D.C., may be at a standstill, but at least there is a formal process for making decisions. On a global level, we have yet to create the institutions that would allow us to even have the conversation.

Fortunately, we are still far from having to make decisions about deploying geoengineering. Unfortunately, the failure to deal with global warming now is pushing us relentlessly in that direction.

FREE RIDERS, MEET THE FREE DRIVERS OF GLOBAL WARMING

Climate change is a problem because too few of us consider it one. And those of us who do can do little about it unless we get everyone

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else to act. Either we solve this problem for everyone, or we solve it for no one.

That, in a nutshell, is what makes the problem of anthropomorphic climate change so difficult to solve. You alone can do little beyond scream to get the right policies in place, which could then guide the rest of us in the right direction. Meanwhile, the overwhelming majority of the seven billion of us on this planet are "free riders." We don't pay for the full cost of our actions.

Worse, polluting is subsidized worldwide to the tune of some $500 billion annually. That averages out to a subsidy of around $15 per ton of carbon dioxide emitted, much of it in oil-rich, less-developed countries including Venezuela, Saudi Arabia and Nigeria that sell fuel at home below the world market price, as well as in China and India. Every one of these dollars is a step away from creating the right incentives. That is, instead of paying for the privilege of polluting, we are paid to pollute. Meanwhile, carbon dioxide "prices" in most of the United States, with the notable exception of California, are close to zero. That estimate assumes subsidies of around $3 per ton of carbon dioxide roughly balanced by direct and indirect measures such as energy efficiency standards and renewables mandates.

Every time you fly from New York to San Francisco and back you put roughly a ton of carbon dioxide into the air, some of which will stay there for decades or even centuries after your trip. That's you personally, not the whole plane, which emits proportionately more. And that ton will cause at least $40 worth of damage to the economy, to ecosystems and to health.

Assume, for argument's sake, that all seven billion humans board planes once every year. Also assume that each flight creates about one ton of carbon dioxide pollution per passenger.

If all seven billion of us flew, we'd collectively cause seven billion times $40 in damage. Divided by seven billion, we'd get back to each person facing a price of $40. But no one is facing the "right" $40 in terms of incentives.

That's the crux of the problem. Every person faces the same choice set: "my benefit, seven billion people's cost." As a result, we largely ignore the consequences of our actions, collectively flying too much and saddling society with enormous costs. But no one has the right financial incentives to try to do something about it. Voluntary coordination is a nonstarter: getting seven people to agree on anything is tough; getting seven billion to agree is impossible. That's where governments need to come in, and even there we find global cooperation very difficult.

Every time you fly from New York to San Francisco and back you put roughly a ton of carbon dioxide into the air, some of which will stay there for decades or even centuries after your trip. That's you personally.

So far, not so good. But free riding is only half the problem. "Free driving" may be just as important. That's where geoengineering gets behind the wheel, and we end up back at Mount Pinatubo. About 20 million tons of sulfur dioxide managed to wipe out the global warming effects of 585 billion tons of carbon dioxide in the atmosphere. That's leverage. It's also another way of saying that it would probably be cheap to duplicate the cooling effects of Mount Pinatubo intentionally – "cheap," that is, in the narrow sense of the direct engineering costs of injecting 20 million tons of material to the stratosphere.

We may hate the idea of countering amazing amounts of pollution with yet more pollution of a different type. But the option is simply too cheap to ignore.

It's not like anyone would literally mimic Mount Pinatubo by pumping 20 million tons of sulfur dioxide into the stratosphere. At the very least, given current technology and knowledge, the sulfur would likely be delivered in the form of sulfuric acid vapor. Sooner rather than later, we may be looking at particles specifically engineered to reflect as much solar radiation back into space as possible, maximizing the leverage.

It may only take a fleet of a few dozen planes flying 24/7 to deliver the desired amount. Some have gone as far as to calculate how many Gulfstream G650 jets it would take to haul the necessary materials. But such specifics are indeed too specific. What matters is that the total costs would apparently be low compared to both the damage carbon dioxide causes and the cost of avoiding that damage by reducing carbon emissions.

Estimates are all over the place, but most put the direct engineering costs of getting temperatures back down to pre-industrial levels on the order of $1-to-$10 billion a year. Now, $1-to-$10 billion is not nothing, but it's well within the reach of many countries and maybe even the odd billionaire.

If a ton of carbon dioxide emitted today generates $40 in damage, we are talking fractions of a penny for the sulfur to offset it. That's three orders of magnitude lower, and it creates circumstances that are exactly parallel to the free-rider misincentives that have caused the problem in the first place. Instead of one person enjoying all the benefits of that cross-country round-trip and the other seven

billion paying fractions of a penny each for the climate damage that one ton of carbon dioxide causes, here it's one person or (more likely) one country being able to pay the costs of geoengineering the entire planet – and potentially without consulting the other seven billion people.

Welcome to the free-driver problem. If climate change is the mother of all "externalities," as economists like to call it, geoengineering is the father, and the world is the child stuck in the middle. If mom says "no," go to dad and see whether he says "yes." The chance is pretty good, seeing as he's facing the exact opposite incentives from mom: a game of good-cop/bad-cop on a planetary scale.

Geoengineering is too cheap to dismiss as a fringe strategy developed by sinister scientists looking for attention and grant money, as some pundits would have it. If anything, it's the most experienced climate scientists who take the issue most seriously. And not because they want to.

OF SEAT BELTS AND SPEED LIMITS

In February 1975, a who's who in biomedical research descended on the Asilomar Conference Facilities, a small seaside resort in Pacific Grove, California, to discuss laboratory safety standards for the burgeoning discipline of recombinant DNA research. There was lots of promise to the research, but also significant danger – not least that the science would get ahead of public understanding and evoke a backlash that could result in defunded labs and shuttered science programs.

By all accounts, Asilomar, as the meeting came to be known, was a success. Research had, in fact, been halted ahead of the meeting because of public outcries over its possible dangers. Since then, recombinant DNA research has given us, among many other things, the hepatitis B vaccine, new forms of insulin, and gene therapy – not to mention a Nobel Prize in chemistry for Paul Berg, the co-organizer of the 1975 meeting.

That meeting also provided a model for how scientists can and should engage the public when their research hits particularly touchy subjects. Ahead of Asilomar, even Berg's own co-investigators had asked him to stop his research because of fears of biohazards that could lead to cancer in lab technicians or worse. The "Asilomar Process" assured scientists and helped guide science policy for decades to come.

It's almost comical to believe nowadays that a single meeting like that, assembling a few dozen biologists, a handful of physicians and the occasional lawyer, could assuage the public and policymakers alike in order to do what's right for science. You can already imagine the conspiracy theories swarming around. The newspaper editorial headlines practically write themselves:

How Far Is Too Far? Should Scientists Decide Their Own Limits?... The Brave New World of Hacking Your Genes… Hacking the Planet: Who Decides?...

The last of these headlines was, in fact, a real one. *The New Scientist* used it for an editorial entitled "Asilomar 2.0." That's at least how the organizers wanted it to be known. In March 2010, prominent climate scientists, budding geoengineers, a few journalists and the odd diplomat and environmentalist descended on the Asilomar facilities to try to rekindle the spirit of 1975. It was a gathering of the who's who in another burgeoning area of research with a lot of promise and quite a bit of potential for public backlash: geoengineering.

The opening line from a co-organizer set the tone: "Many of us wished we wouldn't be here." Most scientists wished instead that the world had heeded their advice and done something about global warming pollution

decades ago. Steve Schneider, who has since died, spoke passionately about his climate research that had raised some of the first alarms, going back even before 1975. He had just written his own firsthand account, *Science as a Contact Sport: Inside the Battle to Save Earth's Climate*. But he wasn't there to sell or sign books. He came to lament the fact that it had come to this. Every scientist who spoke prefaced his or her words by saying that the "told-you-so's" were bittersweet.

Geoengineering treats the symptoms without reducing the underlying problem. Pick your favorite analogy. It's like chemotherapy or a tracheostomy for the planet: a last-ditch effort to do what prevention failed to accomplish.

That's where we are now. Some of the most serious climate scientists are looking toward geoengineering as an option – not because they want to, but because it may well be our only hope for avoiding a climate catastrophe. Mount Pinatubo-style remedies have gotten significant attention of late for precisely that reason.

These scientists also highlight one of the key problems that comes up when discussing geoengineering. As we're sucked into the free-driver problem, we inevitably spend less time trying to solve the free-rider problem. Life comes with trade-offs. Spend the better part of your workday worrying about shooting tiny sulfur-based particles into the atmosphere, and you don't spend that time worrying about getting carbon out of it.

The same conundrum holds outside the lab: why reduce emissions if we know that the latest technological advance can solve the problem without changing our ways? The best response is simply that geoengineering treats the symptoms without reducing the underlying problem. Pick your favorite analogy. It's like chemotherapy or a tracheostomy for the planet: a last-ditch effort to do what prevention failed to accomplish.

For an analogy closer to the issue at hand, geoengineering is not unlike coping with higher temperatures and other climate impacts through adaptation. While no one nowadays would dispute the need to adapt to global warming already baked into the system, not too long ago environmentalists cautioned against even saying "adaptation" out loud. They were worried that doing so would distract from efforts to reduce carbon dioxide emissions in the first place.

Wearing seat belts makes some drivers feel so safe that they drive more recklessly. But that's hardly an argument against seat belt laws. It just means we need to set (and enforce) speed limits, too.

If the prospect of injecting millions of tons of tiny, artificially engineered particles into the planet's stratosphere to create a sunshield of sorts doesn't scare you, you haven't been paying attention. Not too surprisingly, it turns out that the vast majority of Americans haven't. Polling guru Tony Leiserowitz at Yale has asked Americans, "How much, if anything, have you read or heard about geoengineering as a possible response to climate change." The vast majority (74 percent) said: "Nothing." Of the other 26 percent who had heard the term, only 3 percent knew what it meant.

None of that means that we shouldn't take geoengineering seriously. We may be racing

past so many climate change tipping points that this kind of planetary "chemotherapy" is already needed. But at the very least, we ought to find out the full implications. We can't wait and hope for the best; nor can we hope that the free-driver effect won't ever show its full force.

COOLING THE PLANET, FAST AND SLOW

Mount Pinatubo-inspired geoengineering has its appeal, largely because it purports to be fast, cheap and powerful. But it isn't the only geoengineering option. The basic idea is to reflect more solar radiation back into space. Injecting sulfur-based particles into the stratosphere is just one way, and one of the most daring. Painting roofs white is sometimes proposed as another.

The logic comes down to why winter coats tend to be black, and whites are in vogue between Memorial and Labor days. Black absorbs light; white radiates it back. This is one reason the melting of Arctic sea ice is so disconcerting. Instead of white surfaces radiating the sun's rays back into space, darker water tends to absorb it, feeding a vicious circle that accelerates planetary heating. Ubiquitous white roofs in some parts of the Mediterranean already contribute to pleasant local microclimates. Some would have us duplicate that effect in urban areas elsewhere.

It sounds pretty good, but there are at least three problems. For one, we'd need to know the total impact with much more certainty before we go down that path. White roofs reflect more light, but they do so from the earth's surface. The reflected sunlight doesn't escape neatly back into space. Rather, the light hits soot and all sorts of other air pollutants and particulates, possibly reacting with them to make local air pollution worse.

Second is scale. Painting all the roofs in the world white would only have about a tenth the impact of an annual Mount Pinatubo-size eruption.

That brings us to the third fundamental issue: convincing millions of people to do something that may benefit the planet comes directly back to the free-rider effect. It would be difficult to achieve unless the white-painted roofs would pay for themselves through, say, decreased need for air-conditioning.

There are plenty of options in between Mount Pinatubo-style stratospheric sulfur injections and painting roofs white. An oft-mentioned one is creating artificial clouds or brightening those that already exist. Imagine a fleet of satellite-guided ships spraying water into the air to create clouds. The approach doesn't depend on millions of us doing the right thing. It also doesn't inject anything into the stratosphere that could haunt us once it comes down. Water vapor is all you'd get. In short: it might work, emphasis on "might." Brighter clouds could lower average temperatures, and the effects could even be regionally targeted.

A regionally targeted intervention could help avoid some of the problems introduced by global, Mount Pinatubo-style geoengineering. But there could still be plenty of unwanted side effects with enormous implications. The Indian monsoon may be "only" a regional phenomenon, but it's one on which a country of over a billion people depends for its water and food.

As always, it's a matter of trade-offs. Climate change itself will have plenty of unsavory side effects. The question, then, is not whether geoengineering alone could wreak havoc. (It could.) The question is whether climate change plus geoengineering is better or worse than unmitigated climate change.

One thing is clear: what you gain in possible precision in any regional geoengineering method, you lose in leverage. Brightening

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clouds may be cheaper than avoiding carbon dioxide pollution in the first place, but there are limits to what it might accomplish. Mount Pinatubo-style geoengineering has much greater leverage and, thus – for better or worse – overall impact.

All these geoengineering methods have one thing in common: they don't touch the carbon dioxide already up in the air. That makes them potentially cheap. But it also means they avoid tackling the root of the problem.

Opinions differ on the effectiveness of each of these methods. Opinions also differ on whether they should even be labeled "geoengineering." They are methods of geoengineering in the sense that someone would be trying to alter the earth's atmosphere on a grand scale. It's precisely the issue of scale, though, that's open to question.

Most of these approaches run head-on into the free-rider problem. It requires either the coordinated actions of millions to have an impact, or it takes a few to spend so much money that they are unlikely to do so. In other words, these approaches don't share the properties that make Mount Pinatubo-style geoengineering unique. They have a lot less leverage; they are often expensive and slow. In fact, they look much more like reducing carbon emissions in the first place than geoengineering.

The addiction component of Mount Pinatubo-style geoengineering and its vulnerability to interruption may turn out to be its biggest problem yet.

Cue "carbon dioxide removal" (CDR), confusingly also called "direct carbon removal" (DCR). It, in turn, comes under various guises. "Air capture" takes carbon dioxide out of the air and, for example, buries it underground. "Carbon capture and storage" stops carbon dioxide from entering the air in the first place by intercepting it as it is emitted by smokestacks and treating it in a way to prevent it ever escaping into the air. "Ocean fertilization" does just what the name suggests: dumping iron or other nutrients into surface waters make them more fertile for plant life, which naturally takes atmospheric carbon dioxide. "Biochar" is a fancy term for charcoal and may have effects similar to other approaches that remove carbon dioxide from the air and prevent it from escaping back.

You could even put tree growing into that category; trees take carbon out of the atmosphere naturally as they grow. In fact, there's often little that humans need to do other than get out of the way. Nature takes care of reforestation in many situations, as long as there's no interference.

Of course, we aren't saying that the world shouldn't consider any of these approaches. For example, the world should grow more trees, almost regardless of their climate impact. The same may go for painting roofs white to lower air-conditioning costs. But that doesn't mean we should lump these methodologies together with Mount Pinatubo-style geoengineering. All are important. None is in the same category as shooting tiny reflective particles into the stratosphere directly.

ADDICTED TO SPEED

Everyone's very first cup of coffee tastes unpleasantly bitter, no matter how much sugar and milk you add. The second cup in your life may be a bit more pleasurable. By the 20th, you

may think you are still not addicted and that you could easily skip the 21st and 22nd. But by the 100th cup, stopping is no longer an option.

Mimicking Mount Pinatubo to cool down the planet would follow a similar pattern. The first attempts at deploying geoengineering might well fail. By the 20th, we might be ready to take a break. By the 23rd we'll have discovered a more refined technology, and sooner or later it will be impossible to stop.

Startup woes come with the territory. It's the addiction component that's a worrisome aspect of Mount Pinatubo-style geoengineering. In 1991, Mount Pinatubo cancelled out 0.5°C of warming. Two years later, after most of the sulfur dioxide from Mount Pinatubo had washed out of the atmosphere, temperatures jumped back by the same 0.5°C and resumed growth where it left off.

To date, temperatures have risen by 0.8°C since pre-industrial times. If we wanted to erase that difference using geoengineering and then suddenly had to stop, temperatures would jump back up by 0.8°C. By 2100, this potential jump-back could be on the order of 3° to 5°C, if we haven't severely restricted emissions long before then.

Scientists don't know what would happen with a jump of 0.8°C. They are pretty sure, though, that jumping 3° to 5°C would create serious problems. Slow warming of this magnitude would be bad enough. A sudden jump from abruptly ending geoengineering would create all sorts of additional issues. Moving major agricultural areas from Kansas to Canada would be disruptive, but doing it over a century would at least be possible. Having to do it within a year or a decade is hard to imagine. At the very least, it would be exponentially more costly. Thus the addiction component of Mount Pinatubo-style geoengineering and its vulnerability to interruption may turn out to be its biggest problem yet.

WALK BEFORE YOU RUN, RESEARCH BEFORE YOU DEPLOY

Fortunately, we aren't yet close to anyone seriously proposing to *deploy* geoengineering at scale. Even David Keith, a physicist who wrote *A Case for Climate Engineering*, says that he wouldn't vote for geoengineering deployment now. We are, however, way past the time when serious people are rejecting the idea of proposing *research* on geoengineering.

Asilomar 2.0 was chock-full of scientists and engineers who are actively looking into the "how" of geoengineering; hence their desire for guidelines for moving forward with their research. Plenty of options are already on the lab table. Researchers want to know how far they can go in testing and refining their methods in the real world.

One real hurdle to performing research with the entire planet as your test subject is discerning when the proverbial signal rises above the noise.

The bigger the experiment, the easier it would be to detect the effects. But the lines between research and deployment would quickly get blurry. Even studying the full effects of Mount Pinatubo has proven difficult for precisely this signal-versus-noise issue. Putting 20 million tons of sulfur dioxide into the atmosphere constituted a major disruption; little else could have contributed to global cooling of 0.5°C in the subsequent year. Similarly, reasonable atmospheric mechanisms could explain how adding carbon dioxide and then dimming the lights a bit by means of geoengineering would means less average rainfall around the globe. That alone would explain a higher likelihood for droughts. But despite general advances in being able to attribute single extreme weather events to climate change, linking any one particular flood or drought to single geoengineering interventions would be fraught with difficulties.

CASUALTIES, SCHMASUALTIES

Public opinion does not react well to policy mistakes and unintended consequences. And geoengineering is nothing if not fraught with the potential for error. But not all errors are created equal. There's a big difference between errors of omission and commission: driving by the scene of a car crash is bad, but not as bad as causing the crash in the first place.

It's one thing to study the effects of Mount Pinatubo. The harm had already been done. No one could have prevented the eruption. And it has turned out to be the best-studied major volcanic eruption ever. Let's use that for all it's worth. (Not studying it to its fullest may be an error of omission all by itself.)

All seven billion of us – especially the one billion high-emitters – are committing sins of commission every single day.

It's similarly easy to model Mount Pinatubo-style interventions on a computer. It's cheap; it's low-impact. It may divert attention from pursuits aimed at limiting carbon dioxide emissions, but that's about the worst that can happen. Little harm is done by a graduate student spending extra time on a Saturday in the lab running one more simulation.

It would be very different for scientists to go out and intentionally experiment with the atmosphere. Now we are in the realm of commission, a complicated realm, indeed.

It may not be sensible to link a failed harvest to a small experiment halfway around the world that barely produced enough data to identify the signal from all other climatic noise. But that might not matter. The burden of proof in the court of public opinion would be on those running the experiment.

Let's just take a quick step back to try to put it all into perspective. The greenhouse effect has been a fact of science since the 1800s. The term "global warming" has been around since 1975. The basic science has been settled for decades. We have no excuse to believe that using our atmosphere as a sewer for carbon emissions isn't uneconomic, unethical or worse. All seven billion of us – especially the one billion high-emitters – are committing sins of commission every single day. The effects of our collective actions may end in catastrophe. No individual is guilty of causing climate change, but collectively we all are.

Now contrast that with a group of scientists committed to finding a way out of the global warming mess. They understand the science. They understand that the free-rider effect discourages society from acting in time. They understand that the siren call of the free-driver effect is pushing us toward an all-too-alluring quick fix. They are working on trying to understand if and how that fix could work, and how it could be made safe enough to consider using.

We are not trying to excuse any and all scientific (mis)conduct. Science has plenty of misfits, mercenaries and ill-intentioned missionaries. Not all budding geoengineers should be considered heroes. But at the very least they shouldn't all be branded villains until proven otherwise. Scientists themselves are asking for guidance, as the Asilomar 2.0 meeting and similar efforts make clear. They know they can't go this one alone, even if they wanted to. And most don't want to.

AN ALMOST PRACTICAL PROPOSAL

One of the more sensible proposals for what to do next comes from geoengineering pro-

ponent David Keith. It starts with the M word, as in "moratorium." Scientists themselves need to acknowledge there's a clear danger for the science to run ahead of the public conversation. The only way to stop that is a self-imposed moratorium. Keith, together with Ted Parson, a UCLA law professor, proposes to guide research on geoengineering by three simple steps:

OLIVER WEISS

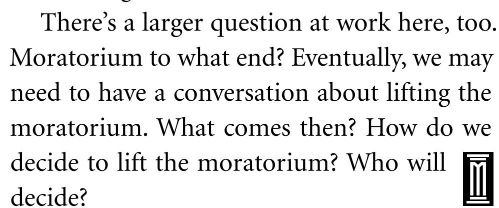
- Accept that there must be limits.
- Declare flat-out a moratorium on all research above a certain scale.
- Set a clear and very low threshold below which research may proceed.

In a sense, these three steps just formalize the natural progression of research: start small; experiment; evaluate; tackle the next challenge. By declaring such a moratorium, their thinking goes, the smaller experiments would become more acceptable. Of course, everything depends on where that line is drawn. It must be very low, indeed; zero is a good starting point.

In all of this, we need to remember that humans are already spewing massive amounts of pollutants into the atmosphere, including the very substances that some geoengineers propose to use to help cool the planet. Research that has a fraction of the impact of any one jet engine is one thing. Research large enough to have detectable impact beyond the narrow confines of the experiment should be a clear nonstarter. In any case, the goal must be a much better understanding of the full set of benefits and costs – and especially the costs of geoengineering.

The fact that Mount Pinatubo-style geoengineering invites a free-driver problem means that sooner or later it will be hard to maintain any such self-imposed moratorium. As long as there are only a dozen or so geoengineers on the planet, all of whom know and respect one another and all of whom agree on the importance of not letting the science get ahead of the public, the moratorium should be manageable. But it's not hard to imagine some scientist somewhere wanting to leave a mark and go it alone.

There's a larger question at work here, too. Moratorium to what end? Eventually, we may need to have a conversation about lifting the moratorium. What comes then? How do we decide to lift the moratorium? Who will decide?



BY CHARLES CASTALDI

BUENOS AIRES — For all appearances, the Escuela de Mecánica de la Fuerza Armada, a complex of buildings along the Avenida Libertador, could pass for a university campus built early in the last century. Trees line the broad boulevard, as it skirts the Plate River. And the edifices across the street evoke the architecture of Paris and Barcelona, remnants of Argentina's Belle Epoque – the beginning of the 20th century when, along with the United States and the Western European powers, Argentina could boast of one of the richest and fastest growing economies on the planet.

That was long ago, in a country far, far away. During Argentina's Dirty War (1976-83), the innocent-looking structures of the School of Naval Mechanics that is known by the acronym EMSA were the center of the military junta's killing machine, a place where thousands were tortured and murdered. And the grandeur of the nearby architecture stands as ironic testament to Argentina's once-great promise and greater disappointments. For this sprawling country – four times the size of France – now holds the dubious distinction of having fallen further and faster than any other in modern times. A century of dysfunctional government and economic mismanagement have kept it on a Sisyphean slope; each time Argentina appears poised for a comeback, another crisis sends it tumbling.

Case in point: the tabloid-style death this year of Alberto Nisman, a special prosecutor who was investigating charges of a cover-up that reached all the way to President Cristina Fernández de Kirchner. This, just when it appeared that the president was going to elude a sword of Damocles wielded by a couple of American hedge funds, whose refusal to accept a discounted repayment schedule on the defaulted Argentine bonds they held had rattled the fragile Argentine economy.

Nisman had spent the past decade investigating the 1994 bombing of the Jewish Community Center of Buenos Aires, which killed 85 people. This, by the way, was hardly the first time that Argentina's 200,000-strong Jewish community – the largest in Latin America – was a target. Two years earlier another suicide bomber drove a truck into the Israeli embassy in Buenos Aires, killing 29. In the 1994 bombing, however, most of the victims were Argentine civilians. Suspicion immediately fell on Iran and its Lebanese client, Hezbollah. But no one was ever brought to justice, and the investigations were so botched that President Nestor Kirchner, who preceded his wife, Cristina, in office, called them a "national disgrace."

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ASSOCIATED PRESS/RODRIGO ABD

This is where Nisman came in. He was either killed or committed suicide the day before he was to present evidence that the president and her foreign minister had conspired to put the kibosh on the pursuit of the Iranian masterminds of the Jewish center bombing in exchange for much-needed Iranian oil. It seems that Nisman's security detail – provided by the government – somehow didn't realize anything was amiss for 11 hours. And the documents containing the allegations against Fernández were found in a trash bin outside his apartment the day after his death.

At first, Fernández said it was a suicide, then claimed it was an assassination carried out by rogue intelligence agents with the intent of discrediting her. The state prosecutor who was charged with looking into Nisman's death announced that she was going on vacation a couple of days later, only to think better of it when Argentines responded with outrage.

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REMEMBERING HISTORY

To paraphrase Winston Churchill (who was referring to the Soviet Union), Argentina is a riddle wrapped in a mystery inside an enigma, and the ESMA that fine day offered a fitting place to ponder the phenomenon. Benign appearances to the contrary, the ESMA is a haunting reminder of how far Argentina can stray from the straight and civil path. It's been turned into a museum dedicated to the memories of the disappeared, who number somewhere between 10,000 and 30,000; as with so much in Argentina, the truth is elusive.

In front of the former naval mechanics school this fine day, a few hundred mostly young people had gathered to commemorate the birthday of the late President Nestor Kirchner, hero to the Peronistas, as the current ruling party is commonly known, and on whose coattails his wife rode into the presidency.

Kirchner, an unknown from Patagonia, the country's sparsely populated south, took

the reins of office in 2003. By then the wheels had (once again) come off the ever-promising (and rarely delivering) Argentine economy. It had been battered by hyperinflation, then depression. Unemployment had reached at least 25 percent. The government had defaulted on a dollar-denominated debt mostly held by foreigners that had ballooned to $140 billion, and, as a coup de grâce, an attempt to prevent Argentines from shifting their hard-currency holdings abroad had led to a run on the banks. In the process, average Argentines had lost half of their savings.

Kirchner turned the situation around in short order. An agreement was reached with most of the creditors, economic growth resumed and unemployment receded to single digits. After his wife succeeded him in 2007, he remained a power behind the curtain. However, in the tradition of so many Latin American political families, the stench of corruption has wafted throughout both of their tenures. It's estimated that their family fortune increased tenfold since the first Kirchner came into office.

The Peronista party, which is officially called the Justicialist Party, has been, along with its main opponent, the Radical Civic Union, at the center of Argentine politics since the former was founded in the 1940s by Juan Perón. Perón, himself a military man, had participated in an earlier coup and catapulted himself to prominence as minister of labor by modernizing labor laws and increasing minimum wages – in the process winning enduring fealty from unions in a country that was divided starkly along class lines.

The coups, countercoups and fraudulent elections that were the mainstay of Argentine politics during much of the 20th century make for dizzying reading. Suffice it to say that by the time Perón won his first term as president in 1946, Argentina's economy, which was heavily dependent on agricultural exports, had been thoroughly bludgeoned by the Great Depression.

Perón's first term initiated an era of considerable growth and much-improved conditions for workers and the poor, as the country spent heavily on social-welfare programs calculated to cement his popularity. But it didn't take long for Perón to stumble in the rubble of his corruption-fed political contradictions. He espoused nonalignment as the Cold War blossomed. In retaliation (and in deference to U.S. farm lobbies), the United States limited agricultural imports from Argentina's vast hinterland. And Perón gave refuge to loads of Nazi war criminals (some of whom ended up in his secret police), even as he was softening official Argentina's inclination toward anti-Semitism by including a number of Jews in his cabinet.

Peronismo, as practiced today by President Fernández, is nothing more than a flag of convenience that blows in whatever direction the political winds are gusting.

When inflation increased, real wages dropped and workers began to strike, Perón, hero of the working classes, did not hesitate to muscle out labor leaders who would not bend to his needs. He had won a second term buoyed in part by the wild popularity of his wife, Eva, beloved as Argentina's embodiment of Catholic piety. But shortly thereafter (after Eva died of cancer), he shook the foundations

of the conservative Argentine bourgeoisie by legalizing divorce and prostitution.

And then there was the issue of his 16-year-old girlfriend. The romance, which Perón never denied, mobilized opposition in the Catholic hierarchy, which edged up to brink of excommunicating the head of state. Perón responded with giant street rallies. And all hell broke loose when the military bombed a pro-Perón demonstration – with Navy fighter jets no less – killing over 300 people. In the rioting that ensued across the country, another military coup forced Perón into exile in 1955.

He made an electoral comeback in 1973, this time with his third wife, Isabel Perón, an ex-nightclub singer, as his vice-president. But by then, the magic of Perón's political theater, and any remnants of his populist patina, had faded. Perón died just months into his term, even as the country was slipping back into low-level civil war. Isabel, who took over for him, proved incapable of dealing with the polarization that was destroying whatever vestiges of democracy remained.

Why recite all that ancient history? For one thing, it hints at the way chaos has of breaking through Argentina's veneer of charm and civility. For another, it makes it all too clear that Peronismo, as practiced today by President Fernández and cheered on by the crowd at the entrance to the ESMA that day, is nothing more than a flag of convenience that blows in whatever direction the political winds are gusting.

In front of the school, music blared, banners snapped in the breeze and the multitude occasionally broke into chants. One of them, "give us back our dead," a reference to the disappeared, raised a question that I posed to a young woman next to me. Doesn't it seem ironic that Peronistas are calling for justice in front of the building where Perón and his wife created the secret police responsible for so many disappearances? Her expression of disdain toward me said it all.

ASSOCIATED PRESS/NATACHA PISARENKO

Oscar Parrilli, the then-secretary of the presidency, greeted me backstage at the birthday rally with a kiss on both cheeks. Parrilli now heads the Intelligence Secretariat, newly formed as part of Fernández's belated attempt to bring rogue elements under her control. Parrilli waxes enthusiastic over Nestor Kirchner's legacy, and when I ask if Fernández will be remembered the same way, he stays on message: "She'll be remembered for her own merits, for continuing where Nestor left off, for protecting Argentine sovereignty."

As to whether Argentina is better off now than when she took office, Parrilli says, "definitely yes. And we'd be even better off if we weren't being held hostage by foreign interests who are driven by uncontrolled avarice." This, a not-too-veiled reference to the so-called vulture funds, the American hedge funds with portfolios stuffed with Argentine sovereign debt bought cheaply. They're the investors who broke from the majority and refused to take the deal offered by Argentina after the 2001 default.

These holdouts subsequently sued Argentina for 100 cents on the dollar. And last year they got a big boost from a federal judge in New York, who ruled that Argentina could not pay off bondholders who had accepted the deal until the holdouts were made whole. Fernández has made hay from the decision, casting herself as David taking on the American Goliath and calling the holdouts "economic terrorists." In the meantime, Argentina has been shut out of international credit markets, but is managing to import goods on terms that amount to cash and carry.

A MONUMENT TO SELF-DESTRUCTION

The ESMA museum is empty on this particular day, the wind coursing between buildings and carrying with it wisps of music from the rally outside. This is where most of the leftist guerillas, trade unionists, journalists, students, Jews and pretty much anyone suspected of having read *Das Kapital* were tortured, then disposed of, during the Dirty War. The Argentine military's name for the suppression of dissent was the Process of National Reorganization, an Orwellian expression well in keeping with Argentina's loose grip on reality.

But one monument to Argentina's self-destructive tendencies was apparently not enough. At the far end of the ESMA campus is the spanking new Museum of the Malvinas, an oddly grandiose tribute to the 1982 Falklands War, which started with an Argentine invasion of the lightly defended British islands that lie 300 miles off Patagonia. The Argentine military junta had assumed that British Prime Minister Margaret Thatcher would just let the new reality of the ground remain, since the 8,000-mile distance between the Falklands and Britain made a military response a logistical nightmare. This was, as we now know, a gross miscalculation. The Argentines lost 649 combatants, and the military junta that started the war lost face – and a short while later, power.

The museum goes to great lengths to explain why, for reasons of geography, historical sovereignty and even ecology, the Falklands are really, truly Argentine. And it does a very good job of building the case from the Argentine point of view, skillfully avoiding the details that make the whole story almost impossible to sort out. The Spanish, French, English and Argentines have taken turns running the barren archipelago, which was valued for its fishing and seal hunting. But most of the time, the few Argentine settlers were left to their own devices, which inevitably degenerated into internecine fights. Eventually, the British took advantage of a mutiny, arrived to restore order and made it a colony in 1840.

The Falklands/Malvinas War continues to have very strong emotional resonance with Argentines across the political spectrum. "Sovereignty over the Malvinas is one of the pillars of Argentine culture, even if it was a diversion that failed utterly," says Ignacio Zuleta, the editor of *Ambito Financiero*, Argentina's variation on *The Wall Street Journal.*

The fact that the loss brought about the end of a brutal dictatorship is seldom part of the narrative, he notes. The war was the military junta's way of distracting Argentines from dire economic circumstances at home. And now the blow to Argentina's national honor dished out by Perfidious Albion serves President Fernández in much the same way. Sure we've got 25-plus percent inflation and corruption up to the eyeballs, but we're standing up to the imperialists.

Transparency International's Corruption Perception Index ranks Argentina below the likes of Liberia, Egypt and Moldova.

FUDGING THE NUMBERS

Fernández has plenty of reasons to draw attention away from her policies, not the least of which became apparent when I passed a closed foreign-currency-exchange storefront, whose shuttering Zuleta attributed to the Fernández government's frantic efforts to reassert the peso's claim to stability. "They have an overvalued currency and they can't get out from under it. It makes changing pesos at the official rate complete insanity," he explained. In fact, buying Argentine pesos is best done on the black market, where the exchange rate for dollars is almost double the official rate.

Restricted access to dollars isn't just manifest in the dearth of imported luxury products in the stores that line the streets in Recoleta (the swank residential neighborhood best known for its eponymous cemetery), but also in the lack of investment in manufacturing, which has been strangled by the high costs of imported machinery and raw materials. "This government doesn't care about productivity, they care about power," Zuleta laments. "There's no long view in this government."

Zuleta rolls through the numbers, pointing out that on top of everything else, the government's published statistics are fudged. The government estimated inflation at 20 percent last year, but most experts say it was more than twice that. The GNP is thought to have fallen by 10 percent (though nobody truly knows), largely due to the investment chill and the drop in global commodity prices.

The official unemployment rate number, around 7 percent last year, is also suspect. But it wouldn't necessarily be good news even if it were accurate. The government's fear of the people's wrath has led it to plow huge sums into social programs. "The government wants to maintain employment, which they've done at great cost to the overall economic health," Zuleta argues. Fernández's largess on social spending has taken government spending from 20 percent of GDP when her husband took office to almost 40 percent today, a figure that is untenable in the long run.

"We have a minister of economy who is trying to demonstrate that 200 years of classical economics it wrong," Zuleta says, referring to Axel Kicillof, the dashing 43-year-old whose claim to fame was the nationalization in 2012 of Spanish energy giant Repsol's stake in Ar-

gentina's energy sector. "They are so focused on employment they don't care about exchange rates and lowering tariffs. Look at what they've done to the agricultural sector. Wine producers are selling grapes instead of making wine because of export and currency restrictions."

UPHILL PUSH

The following morning, I went to the Congressional Palace, home to the Congress of the Argentine Nation, to speak to Federico Sturzenegger. He's a Buenos Aires deputy for the Propuesta Republicana party (PRO), the

REUTERS/MARCOS BRINDICCI

As we downed another round of delicious espressos – in this, the Argentines are world class – Zuleta explained that in the end, much of what goes on in Argentina is based on "clientelism," a pervasive form of soft corruption in which arms-length transactions are replaced by commerce based on exchanges of favors – as in "you give me something, I give you something." Actually, not all the corruption is so soft: Transparency International's Corruption Perception Index ranks Argentina below the likes of Liberia, Egypt and Moldova.

equivalent of a moderate Republican, when such creatures were not yet extinct. Sturzenegger received his doctorate in economics from MIT and taught at Harvard's Kennedy School of Government. Before being elected deputy, he had run the Bank of Buenos Aires, a bank owned by the city, transforming it from a perennial money loser into an institution with a sizable cash surplus.

On the day we met, the Congress was discussing reforms to hydrocarbon laws in the hopes of spurring investment and production

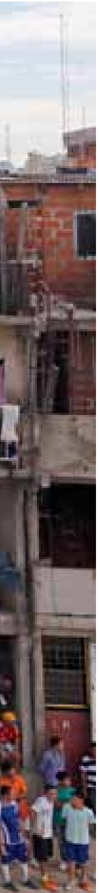
Tremendous potential is in a constant struggle with venality, bureaucratic incompetence and shortsightedness.

in the Vaca Muerta shale formation – the second largest in the world. Argentina suffers from a serious energy deficit, which has only added to its hard-currency woes, and Vaca Muerta is seen as a way to claw its way back. But the government's currency controls makes the importation of equipment expensive. And it's erratic policies, including Economics Minister Kicillof's nationalization of Repsol's Argentine subsidiary, compounded the problem by making executives at Shell and ExxonMobil skittish about plowing more into their Vaca Muerta stakes.

The new law would allow companies with as little as $250 million to invest to get a piece of the action, and it would ease restrictions on repatriating earnings. Sturzenegger says the reform is as much about desperation as it is good husbandry of resources. "This government has been a very poor manager of public goods," he says. "It's a form of socialism without planning and capitalism without markets."

He thinks energy companies will hold back until Fernández leaves office at the end of this year, at which point he expects a more market-friendly president could turn things around.

REUTERS/ENRIQUE MARCARIAN



The Kirchners have "spent years telling producers how to produce, telling people how to live; how to spend; how to travel;" he says. "This has been a huge drag on productivity."

His view in this regard is widely held. No matter who wins – and it will likely be another Peronista – candidates are all distancing themselves from Fernández's populist policies. "It will be like walking into a company that is very disorderly, but which doesn't have foundational issues," he says, "a company where lots of things don't work, but where you have no debts, no contingent liabilities – a situation that could be rectified with good management."

Sturzenegger argues that if the next government finds a way to negotiate with the bond holdouts and to loosen currency restrictions, capital will again flow into Argentina. "I am an optimist," he says. "I have to think that at some point we can break out of these cycles where the policies are all based on short-term thinking."

VERY HUMAN CONSEQUENCES

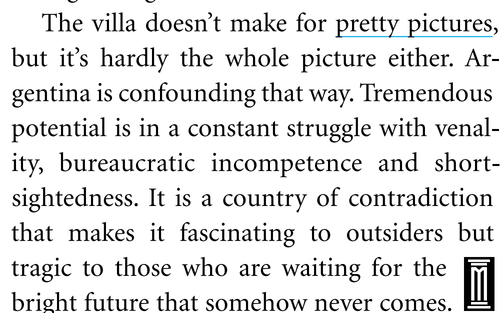
From the Congress, I hopped in a taxi and asked the driver to take me straight south on the Avenida Entre Rios. He asked me for an address and when I told him I was on my way to the villas, he turned to look at me with an expression of alarm. The slums of Buenos Aires are known as villas miseria (villas, for short), and the most notorious of these are on the south side of the city.

Just as in any large metropolis these days, it isn't just the nature of the buildings that change from neighborhood to neighborhood, but the ethnicity of the residents. And in Buenos Aires, as in the rest of Latin America, that means the people are not just poorer, but darker complexioned and often immigrants – in this case, from Bolivia, Paraguay and Peru.

They come here for jobs and access to Argentine social programs. Officially, 11 percent of Buenos Aires' residents are foreigners, but the actual figure is likely higher. Argentina, of all the countries in Latin America, most resembles the United States in its demographic history. With a few exceptions, the indigenous populations that existed before colonization collapsed, either through extermination or as casualties of imported diseases. The result is that modern Argentina, along with Uruguay, its northern neighbor, was mostly populated by people from Europe and their descendants. But the new influx of immigrants is changing that, and Argentina hardly seems prepared.

The villas are not as decrepit as the slums of most other Latin American countries, but any American slum would still look positively middle class by comparison. The government says 5 percent of Argentines are poor, while independent researchers come up with numbers as high as 30 percent.

Whatever the reality, Buenos Aires' villas have no shortage of poor people – and no abundance of public services. Here, garbage is thrown out into certain streets spontaneously anointed as collection points by the residents, running water and proper sewage are hit-or-miss propositions and the roads are so potholed that it's a stretch to call them paved. And the bad is getting worse: drug trafficking, a relatively new development, has nourished a gang culture and the territorial disputes and killings that go with it.



The villa doesn't make for pretty pictures, but it's hardly the whole picture either. Argentina is confounding that way. Tremendous potential is in a constant struggle with venality, bureaucratic incompetence and shortsightedness. It is a country of contradiction that makes it fascinating to outsiders but tragic to those who are waiting for the bright future that somehow never comes.

AFTERTHOUGHT

BY ROBERT J. SHILLER

Robert J. Shiller, a professor at Yale who won a Nobel Prize in 2013, has become as close to a name brand as an economist can get – and deservedly so. His penetrating analyses of asset markets have incorporated the new thinking of behavioral economics, which turns as much on the discipline of psychology as on economics. And his book, Irrational Exuberance*, *first published in 2000, gave both policymakers and investors insights into the causes of the stock market and real estate bubbles that have convulsed the global economy for much of the new century. The just-published third edition of the book brings the bubble story up to date. And it includes this spanking new chapter on the bond market and its potential for collapse.*

The path of interest rates through time has been a matter of intense public concern. For interest rates are viewed as central to everything in the economy – as something abstract and fundamental, the price of time itself. And yet they show fluctuations through time that reveal a speculative and human component, not entirely unlike that of the stock market.

There are both short-term interest rates (rates on loans or bills for a year or less) and long-term interest rates, rates on bonds, mortgages or loans extending over decades. Prices of long-term bonds, once issued in the marketplace, move opposite the general level of long-term interest rates: when long-term interest rates fall, prices of still-outstanding long-term bonds previously issued rise, since, unless their price increases, investors would prefer those older bonds bearing higher interest to the newer ones. Thus, changes in the outlook for future interest rates can cause booms or crashes in the long-term bond market.

For over a century, central banks (in the United States, the Federal Reserve) have exerted control over short-term rates. It is well known that these rates are easily set, at least approximately, by central banks. Long-term interest rates, however, are more speculative and more difficult to control because, just as with the stock market, the public's demand for them depends on comparisons with the outlook for the distant future, which is dependent on things central banks cannot control today. Since the 2007-9 financial crisis, central banks have adopted important new policies to influence long-term interest rates, with names like "quantitative easing," "operation twist" and "forward guidance," but they still today do not really control this market.

Discussions over the past century have sometimes used the phrase "bond bubble" to describe upswings in the bond market. Certainly, the bond market has something akin to bubbles in it from time to time, occurring

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when long rates are falling and so people are excited by the rise in bond prices, just as they are by stock prices in a stock market bubble. And bubbles in these two markets might sometimes be related to each other.

INTEREST RATES AND CAPE

Interest rates are one of the most discussed terms relating to the level of the stock market. During the stock market boom of the 1990s, it was widely noted that long-term interest rates were falling. And the idea that the decline in interest rates could explain the rise in the stock market was widely expressed during the 1990s.

The Monetary Policy Report submitted in conjunction with Fed Chairman Alan Greenspan's testimony before Congress in July 1997 showed evidence of a noticeable negative correlation between the 10-year bond yield and the stock market's price-earnings ratio since 1982. Indeed, there did appear to be a relationship between interest rates and the price-earnings ratio at that time. In fact, between the mid-1960s and the early 1980s, interest rates were rising and the price-earnings ratio was declining. Between the early 1980s and the late 1990s, when Greenspan spoke, interest rates were falling and stock prices were rising. And this relation between the stock market and the 10-year interest rate came to be known as the "Fed Model."

In the late 1990s and the early 2000s, it became fashionable to use the Fed Model to justify the level of the market. Indeed, with declining interest rates, one might well think that stock prices should be rising relative to earnings, since the prospective long-term return on a competing asset, bonds, was declining, making stocks look more attractive in comparison. In the late 1990s, it sometimes seemed that one heard reference to the Fed Model almost ad nauseam on the television business shows.

However, the evidence for the Fed Model is rather weak. Over the whole 1881-2014 period, no strong relation can be seen between interest rates and the price-earnings ratio. In the Great Depression, interest rates were unusually low, which, by the Fed Model, would imply that the stock market should have been very high relative to earnings; that was not the case.

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Interest rates continued to decrease after their peak in the market after the year 2000, and then we saw the opposite of the predictions of the Fed Model: both the price-earnings ratio and interest rates were declining. Since this happened, one has heard a lot less about the Fed Model.

Although interest rates must have some effect on the market, stock prices do not show any simple or consistent relation with interest rates. Still, investors looking at a very high cyclically adjusted price-earnings ratio (the CAPE) when long-term government bond

yields are very low, as they have been especially since the financial crisis of 2008, will not be as discouraged from investing in stocks because of the poor alternative.

The CAPE has come under some criticism since the second edition of this book. Bill Gross, founder of PIMCO and now at Janus Capital, complained that discussions of the ratio often do not take into account the very low interest rates since the crisis. Indeed, the 10-year U.S. Treasury yield to maturity in July 2012 fell to a historical low of 1.43 percent, and while higher today, remains very low by historical standards.

In such circumstances, perhaps investors will not want to switch from stocks to bonds even if the CAPE is high. Moreover, the U.S. bond market, showing such low yields, looks as if it may have been going through something of a bubble, too, and may collapse further eventually, especially given the imminent withdrawal of the support of quantitative easing from the Federal Reserve and a likely increase in inflation.

Gross, with his "new normal" or "new neutral" pessimistic view of the economy, gives lower probability to such a collapse than I would, but he is right that the apparent overpricing of the stock market – whenever it occurs – has to be compared with the possible overpricing of other markets as well.

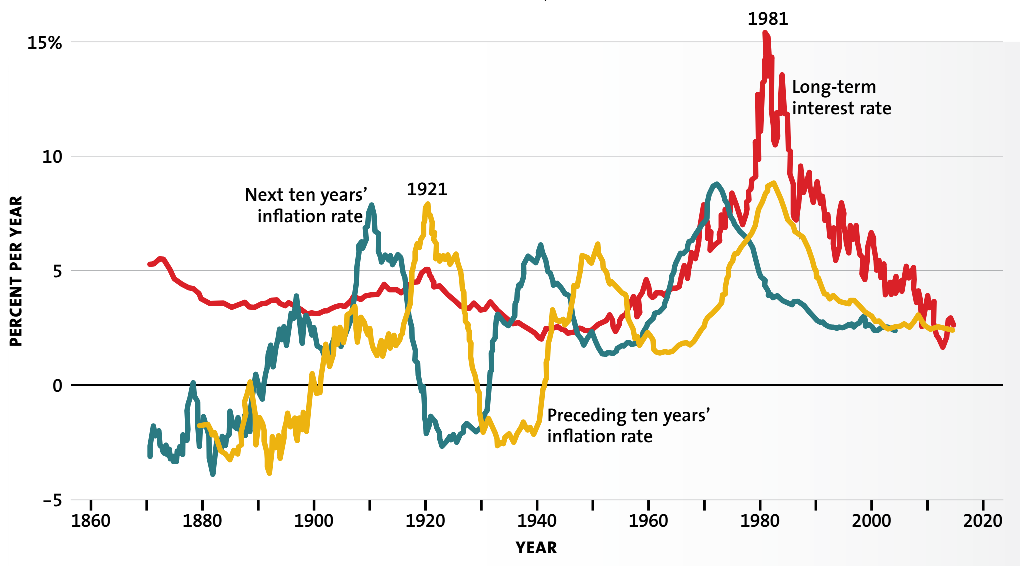
INFLATION AND INTEREST RATES

The figure on the opposite page shows plots of U.S. government long-term interest rates (the 10-year Treasury rate since 1953) and inflation rates since 1881. Two inflation rates are shown. One is the annual rate of increase of a price index (the Consumer Price Index since 1913) for the preceding ten years. The other is the annual rate of increase of the same price index for the succeeding ten years. The two inflation rate curves are the same, but one is shifted relative to the other by ten years. Both are included here to make a point.

It is easy to see a positive contemporaneous relation between interest rates and preceding long-term inflation rates for much of the time – especially the most recent half-century – but there appears to be practically no relation between long-term interest rates and future long-term inflation. It is the future inflation rate that ought to matter more if investors successfully priced long-term bonds to protect their real returns from inflation over the future life of the bond they are investing in, just the opposite of what we see. Jeremy Siegel and I documented this in 1977 and linked this observation to descriptions of earlier observers A.H. Gibson in 1923 and John Maynard Keynes in 1930.

If investors have rational expectations, they should be employing past data on inflation in such a way as to adjust nominal bond yields to successful predictions of the future.

The relation between long-term interest rates and long-term inflation that can be seen for the last half century is not the kind that a simple assumption of human rationality would lead one to expect. If investors are rational (have rational expectations), they should be employing past data on inflation in such a way as to adjust nominal bond yields to successful predictions of the future. We see that they did seem to respond to past data, but in a



way that was very unsuccessful in predicting the future.

The fluctuations in yields that we do see in the long-term bond market cannot be well described as resulting from information about future inflation, nor are they well described as resulting from information about future short-term interest rates. They have a speculative component that is hard to pin down in terms of objectively rational behavior.

REAL INTEREST RATES

Over most of the period shown in the figure, many investors perhaps had no idea about what the relation between nominal interest rates and inflation rates should be. It was not until 1895 that Columbia University economics professor John Bates Clark introduced the concept of real interest rates to the world. He wrote about this then-new concept because he discerned widespread public confusion about interest rates at the time of the national debate on the proposed bimetallic standard [for the money supply].

The real interest rate on any debt instrument, he said, is the interest rate minus the inflation rate over the life of the instrument. If the inflation rate is greater than the interest rate, the bond would be producing less than nothing in real terms for the investor, since the buying power of money would be reduced by more than the increase in the money the instrument provides to its investor.

A search on Google Ngrams shows that the phrase "real interest rate" was never used before 1892, began to appear incrementally from that time, and did not really become common until after 1960 – after a very long gestation period for Clark's idea.

One might think, if investors have good information, are rational and are interested in the real interest that they will receive, that market-determined bond yields would stay just a steady amount above the subsequent inflation rate.

One can see from the figure, though, that this has never been true for the United States – although, since around 1960, it became

somewhat true for backward-looking rather than forward-looking inflation.

The significance of movements in long-term interest rates over time, as seen in the figure for the United States since 1871, is not clear. Plainly, people were not pricing bonds as if they were just reacting to rational expectations about future inflation rates. Theorists often say that ratios like the price-earnings ratio in the stock market ought to be more closely related to expected real (inflation-corrected) long-term interest rates, which have been largely unknown, than to nominal rates. But that is based on the assumption that investors routinely see through nominal rates to real rates.

Inflation-indexed bond markets, which directly reveal real interest rates, did not exist in any major country in the early 1980s, but have since begun to appear. These bonds promise to pay a constant real return. The figure on the opposite page shows the behavior of inflation-indexed long-term government bond yields for four countries that have had these markets for a long time.

All these countries show a long-term downtrend in real interest rates – down to amazingly low levels by 2012. Recently, the real bond yields have sunk to negative values in both the United States and the United Kingdom. It is quite striking that in 2012 in the United States, people were willing to tie up their money for 30 years at an essentially guaranteed negative real return.

This fact would certainly seem to have implications for the stock market, impelling it toward higher valuation.

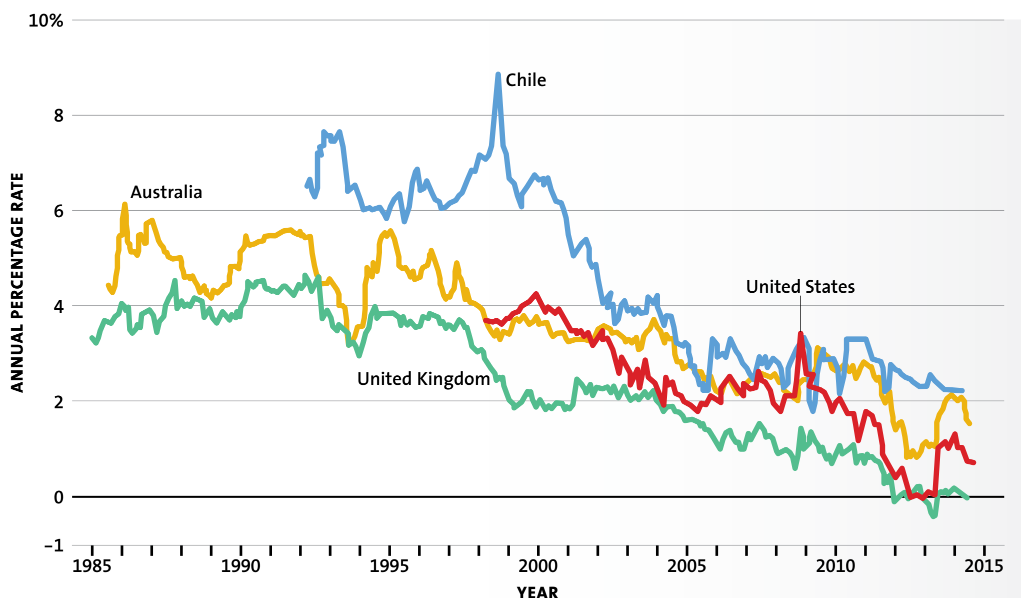
Financial theorists, including John Campbell and Luis Viceira, have spoken of the long-term indexed bond yield as the true riskless rate, against which all risky asset returns should be compared, and which should figure into every long-term investor's most fundamental calculations.

But most investors just do not seem to see the centrality of the indexed bond yield that theorists often seem to attribute to it. They often do not even seem to understand that inflation indexation protects them from price-level risks, and sometimes seem to think that indexation introduces a risk – the risk that their nominal values will be lower. The path downward does not reflect the ups and downs of the stock market any more than does the downward path of nominal interest rates over this interval.

Unfortunately, even with these data, especially in the earlier years of inflation-indexed bonds, it has not been completely clear what the broad investing public likely thought over these years about expected real returns on safe assets. When each of the countries shown in the figure introduced their inflation-indexed bond markets, they did so in the face of widespread public indifference. The market for inflation-indexed bonds has grown somewhat over the decades but is only gradually becoming important enough compared to the market for non-indexed conventional bonds to pervade public thinking as some theorists assume. And so a few government officials in charge of the auctions could in principle, influence the prices of inflation-indexed bonds by adjusting the amount offered.

It is one of the puzzles of behavioral economics that people mostly just ignore inflation-indexed markets – that they have so much trouble appreciating the importance of inflation indexation. Still, it is clear that prices in both the market for nominal bonds and the market for inflation-indexed bonds have reached very high levels, and that this fact ought to be part of our thinking about the stock market. It remains unclear what this situation implies for the future. At the time of

INFLATION-INDEXED BOND YIELDS FOR FOUR COUNTRIES



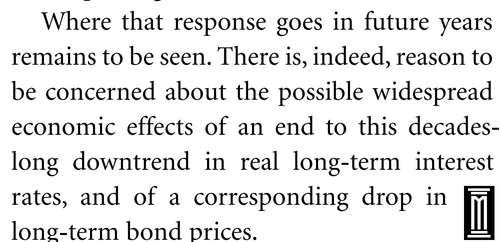
SOURCE: Global Financial Data (www.globalfinancialdata.com/index.html)

this writing in 2014, some observers refer to a "bond market bubble" that might burst, though it seems that this is not a classic bubble as defined in this book, since expectations for long-term return are apparently very low – not high, as one would expect during a bubble. But these trends in the bond market might in some sense be bubble-like.

In 2014 Jeremy Stein of Harvard University, in one of the last speeches he gave as governor of the Federal Reserve System, discussed concerns about a bond market bubble, though he did not adopt that term. He spoke of "overheating" in the credit markets and warned of economic consequences if the bond yields were to suddenly correct upward (bond prices correct downward); he worried about the economic consequences of such a correction.

There must be some hard-to-pin-down cultural factors driving people to invest in bonds at a time when their yield is very low or negative and the stock market has been soaring. Some of the same precipitating factors for the stock market and housing market booms might apply somewhat to the bond market. Also, falling bond yields have produced capital gains for bond investors over the decades, making bonds look successful even if they are guaranteed not to do well in real terms over their time to maturity. The extreme low or negative yields after the financial crisis of 2007-9 might also have something to do with a kind of a flight response, at times of financial turmoil, that does not fit our usual theoretical paradigms.

Where that response goes in future years remains to be seen. There is, indeed, reason to be concerned about the possible widespread economic effects of an end to this decades-long downtrend in real long-term interest rates, and of a corresponding drop in long-term bond prices.



BY MICHELE BOLDRIN AND DAVID K. LEVINE

The need to protect innovation with patents, which used to be holy writ for economists, is still seen as a cornerstone of capitalism by many lawyers and business analysts. But that cornerstone is weaker than you may think. We urge you to suspend judgment and read on.

The case for patents is familiar to most of us. Imagine a world in which patents didn't exist. In that world, an innovator must still decide whether to innovate or not. If the decision is no, nothing is gained (or lost) by the innovator or by society as a whole. If the decision is yes, resources (time, energy, capital) must be expended in getting the innovation to market.

Potential rivals must then choose to imitate or not. If nobody imitates, the innovator effectively becomes a monopolist and reaps the bounty – though, of course, society gets some benefit as well, since something offered at a high price is better than nothing at a lower price. If, however, an imitator does decide to take the plunge in a patentless world, the resulting competition will likely prevent the innovator from even recovering its costs. Society still reaps the benefit of the innovation, and at a low price. But, unfortunately (as the standard story goes), the societal gains are pyrrhic because potential innovators will lose the incentive to innovate.

The moral of the story: no patents, no party. If we want to live in a world where new products, services and production technologies are born from private initiative, we must accept the idea that successful innovators will reap large profits at the near-term expense of consumers.

But typically, this conclusion is unwarranted. Even in the absence of patent protection, imitators' prospects for profit in competition with innovators are at least as problematic as those of the innovator. In the previous story, if the innovator cannot recoup its costs, neither can imitators. Foreseeing this, potential rivals often don't enter the market, leaving the innovator with the opportunity to earn profits commensurate with the risky investment.

DRILLING DEEPER

What is going on, then? The conclusions reached by the familiar case for patents generally rests on two key assumptions:

• Imitators can enter the market at the same time as the innovator, or at least very shortly afterward, thereby denying the innovator first-mover advantages.

• Once they enter the market, both the innovator and the imitator will have no difficulty

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scaling up to meet demand, thereby limiting either's ability to profit from initial shortages.

These assumptions rarely pass muster. Yet, in one form or another, they have endured, even in the sophisticated economics literature on the sources of growth, which have stressed the role of patents and the resulting monopoly power as the engines of innovation and growth.

In our own research, we start with the polar opposite assumptions – namely, that imitation generally requires significant amounts of time and resources, and that both innovators and imitators initially face constraints on production capacity. These assumptions, we believe, are closer to reality.

To see why incentives for innovation survive in the absence of patents, look more closely at how an innovative industry evolves. As in a world of patent protection, at the start there is still the innovator, who can enter the market at considerable expense, developing the new product and building some manufacturing capacity. Imitators may or may not enter right away. But even in the case in which imitators can break in quickly, they also do so with only limited capacity.

This implies that the industry's total output will be limited by the innovator's and imitator's capacity, allowing both companies to sell the new good for more than its marginal cost. They thereby reap what economists call competitive rents – revenues above direct production costs – and what pretty much everyone else calls handsome profits. As more imitators are attracted and the industry's total capacity expands, these rents will be reduced. But only in the most extreme circumstances will capacity reach the point at which prices are driven down to marginal cost.

It follows that these competitive rents are collected for a considerable length of time by the innovator and imitator alike, and that both have the opportunity to amortize their initial investments. Indeed, since the innovator gets to market first, or establishes a superior reputation, or both, it will generally earn higher rents for a longer time than the imitators.

Smartphones are a perfect example of this dynamic, but far from the only one. Indeed, this is what has happened in virtually all innovative industries, with or without patents to protect the innovator. It has been the case for the chemical industry since its inception, and was, even for the pharmaceutical industry, until the second half of the 20th century when enforceable patents became the norm for drugs. The same has been true for cars, for agriculture and for steel, and even now for the software industry. Tesla, the fabled market leader in electric cars, acknowledged this reality when it decided to dispense with all patent protection.

In fact, the past 200 years of technology-driven economic growth has never been dependent on patents. Technological progress has followed a simple pattern. A new industry is created by one or more innovators in the absence of patents. The first few companies grow even as they imitate one another – what amounts to spontaneous cooperation that is disciplined by the incentives of competition and that generates major cost reductions and product improvements. Patents take center stage only after the industry matures and a few dominant firms emerge. And those patents are used defensively, either to prevent the entrance of new firms or to limit their market share.

Microsoft is a fine example. Early on, it was opposed to software patents, but now it uses patent protection to protect its dominance in its piece of the software market.

The story of innovation, of course, is not always rosy. Market entrants sometimes overestimate demand, which leads to excessive

entry. In that case, prices don't cover research and development costs, and a subsequent shake-up in which productive capacity ceases to outrun growth in demand become inevitable. But this doesn't invalidate the case against patents. It only implies that, in designing a system of intellectual-property protection, we should acknowledge there is a trade-off between the societal cost of legal monopoly protected by patents and that of excessive production driven by excessive entry.

either impede innovation or bring about costly industrial dislocation, the appropriate response is to confer monopoly rights only in those cases. But which cases actually merit protection – and how should cases be adjudicated?

Start with some basic principles. Standard economic theory justifies some form of intervention to protect intellectual property when the following circumstances lead innovators to conclude that they couldn't otherwise expect to make a profit by going forward.

The costs of maintaining the patent system have been rising rapidly as producers increasingly use patents as strategic weapons to retard competition.

Recast the issue, then. Both theory and historical evidence show convincingly that innovations are generally possible even with competition between innovators and imitators. Further, a plethora of studies covering the past few decades shows that the adoption of patents (as in software and genetically modified plants) or their strengthening (as in pharmaceuticals and biotech) do not lead to higher rates of innovation. These studies suggest instead that the greater the intensity of competition, the more rapid the growth in productivity. Finally, research in economics, management and law provide strong evidence that the costs of maintaining the patent system have been rising rapidly as producers increasingly use patents as strategic weapons to retard competition.

The bottom line here is simple: while, on balance, patents have generated little in the way of societal benefits, they do exact sizeable (and apparently growing) societal costs.

There is thus no reason to maintain a system in which genuine innovations are automatically protected. Rather, if we believe there are cases in which the absence of patents may

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• The fixed costs needed to innovate are especially large relative to production costs.

• Once an innovation appears, imitation is cheap and accomplished quickly.

• Productive capacity can be built up rapidly.

• Even a moderate increase in total sales would lead to a substantial decrease in price.

How often all four criteria are met is an empirical matter, but not one beyond the capacity of reasonable people to discover.

Government agencies often make such judgments in, for example, antitrust cases. It's unclear why a similar approach could not be applied to cases in which an innovation is at stake.

Consider, too, that the extra incentive to innovate need not be in the form of a patent. It could be that a cash prize, financial subsidies or a guaranteed market for successful innovation, which may yield greater incentives per dollar spent than implicit cost of granting monopoly rights through a patent. And in our view, protection should be granted only when the innovation passes the four-step test above.

It should also be noted that opening the door to protection just a crack raises the strong possibility that special-interest lobbying will push it wide open. Hence, on balance, we believe that the better policy choice is to eliminate patents entirely, sacrificing some innovation in return for a system that is surely better than the one we have now.

DRUG DILEMMA

In any event, let's consider one candidate for special-case status – arguably the most plausible candidate – the pharmaceutical industry.

Note that pharmaceuticals has been among the most steadily profitable industrial sectors for decades, despite a long-recognized crisis in the pace of innovation. The number of really new drugs reaching the U.S. market has decreased from around 45 per year in the late 1990s to only 30 in 2011. Note, too, that the industry has become increasingly concentrated, with a relatively small number of multinationals acting as the gatekeepers of innovation and imitation by engaging in endless and costly patent infringement battles. On the periphery are a volatile group of innovative firms lacking the resources to test and distribute drugs, which leaves them with only one practical business strategy: obtain patents on drugs, then sell the rights to Big Pharma.

In 2012, the FDA did approve 39 new drugs – a seeming reversal of this depressing trend. Among them, however, 11 were marketed at prices exceeding $100,000 a year.

Ordinarily, exceptionally high prices are seen as a reason to suspect excessive market power. But the pharmaceuticals makers have managed to turn this suspicion on its head. High prices, they argue, follow from the high cost of testing, layered on top of R&D costs. Without the promise of patents for successful drugs that leads to multi-billion dollar payoffs, they wouldn't innovate in the first place. Once more: no patents, no party.

The problem here is that it is hard to swallow the idea that the primary cause of drug-price escalation is the cost of research and development. While the proprietary nature of the relevant data makes it impossible to come up with a completely reliable number, industry-sponsored studies place the average total cost of bringing a truly new drug to the market at around $800 million to $1 billion.

Look more closely, though, at that billion-dollar price tag. If we subtract both the publicly funded portion of the research and development process and the cost of clinical trials, estimates of the residual technological cost are a more affordable $100–200 million. It's true that drug companies must invest vast sums in testing with highly uncertain outcomes. It's also true they would probably balk if they lacked patent protection (and the market power it gives). But the premise of the case is flawed. There is no good economic reason to ask the drug companies to shoulder the costs of testing in the first place.

The knowledge gained from a clinical trial is what economists call a public good, in this case giving every potential consumer information on the safety and effectiveness of the drug

in question. It may be convenient for Washington to dump the costs of these public goods on private corporations (hence, on patients rather than on taxpayers). But convenience comes at a high price – the need to give monopoly patent rights to drug makers.

Think back to the four criteria justifying patent protection. Many drugs may, indeed, be easy to imitate; producers may not be subject to significant capacity constraints; demand may be very sensitive to price. But the high fixed costs of developing drugs is largely the product of the institutional arrangements for testing – arrangements that could be changed even if one insisted on allowing business rather than government to do the actual testing. For example, once the government determined that a new drug was sufficiently promising to merit advanced testing, it could use competitive bidding to minimize the cost of hiring private contractors to do the work.

In most cases the inherent production and marketing advantages to being the innovator offers plenty of room for profit even without the benefit of patent protection.

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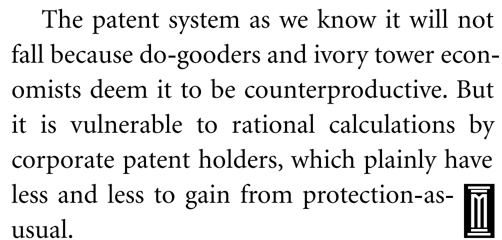
MINDING CHANGE AND CHANGING MINDS

It's not hard to convince people that patents (and other sorts of intellectual-property protection) cost them money. Who doesn't balk at the idea of paying hundreds of dollars for software that only costs a fraction of a penny to distribute via the Internet? It's equally easy to convince them that billions are wasted in battles over property-rights enforcement – think, for example, of the titanic legal struggle between Apple and Samsung. The hard part is explaining that in most cases the inherent production and marketing advantages to being the innovator offer plenty of room for profit even without the benefit of patent protection.

Might we manage some sort of reform, anyway? There is some movement in that direction – in particular in Silicon Valley, where patent protection is increasingly viewed as a major barrier to progress with uncertain short-term benefits even for the Microsofts and Apples of the digital world. And strikingly, there is even some movement in this direction in pharmaceuticals, where the idea of publicly funded testing is no longer entirely anathema to policymakers, and drug makers are quietly licensing emerging-market producers at low rates in the belief that some revenue is better than none.

The patent system as we know it will not fall because do-gooders and ivory tower economists deem it to be counterproductive. But it is vulnerable to rational calculations by corporate patent holders, which plainly have less and less to gain from protection-as-usual.



The Milken Institute's blog, Currency of Ideas, *is increasingly attracting savvy surfers on the lookout for fresh ideas that reflect the eclectic reach of the Milken Institute and its staff. Check it out at: http://www.milkeninstitute.org/blog. Here's an abridged sampling.*

Banking On/With The Millennials

They've outlasted floppy disks, 20-pound laptops and "The Oregon Trail." Now, with most receiving steady paychecks, the millennial generation is ready to adopt financial technology.... Millennial small business owners are five times more likely to receive funding from peer-to-peer lenders than Gen-Xers (the 35-49 crowd), a Bank of America survey suggests, with fewer than half indicating that they would rely on banks for first-time financing needs. As the report further points out, millennials' use of alternative lenders such as OnDeck, Lending Club, Sofi, Funding Circle and Prosper far surpasses that of boomers and Xers.

Along with entrepreneurship, millennials are changing the way we invest and manage money.... Only 14 percent say they would consult with an advisor when making a financial decision. Couple this with their cost sensitivity, interest in passive investment strategies such as exchange-traded funds and comfort with digital technology, and you can see why millennials are drawn to new players such as Wealthfront, Betterment, Personal Capital and Future Advisor. And while these so-called "robo-advisors" have only a small sliver of the $5 trillion managed by registered investment advisors, their expected growth trajectory is astonishing. ...

—Jackson Mueller

What's Inside Yellen's Head?

If remaining doubting Thomases needed additional confirmation of the underlying strength in U.S. labor markets and the broader economy, they received it in the Job Openings and Labor Turnover Survey (JOLTS) for December.... The five-million tally of companies' open positions was up 28.5 percent from December 2013 and the highest since January 2001. New hires in December were 5.1 million – the most since November 2007.... It is sure to weigh heavily in discussions inside the Federal Reserve on when to raise interest rates....

The other side of the tally, separations, totaled 4.9 million in December, virtually unchanged from November, but represented the highest number since October 2008. This indicator would seem to contradict my thesis, but it actually supports it.... While it may seem counterintuitive to herald a rise in people leaving their jobs, it is a confirmation that they are confident enough to jump ship. ...

—Ross DeVol

Intergenerational collaboration, music-style. Can this point the way to new matchups in other domains?

ROBYN BECK/AFP/GETTY IMAGES

And the Grammys Shall Show Them the Way

The 57th Annual Grammy Awards delivered in every way that fans expected – a star-studded red carpet, designer wardrobes and memorable performances. What might not have been expected was a new identity for music, with the business leading us to a fresh outlook on aging and new opportunities for adults, both old and young.

The same industry that years ago gave us the Rolling Stones' "Mother's Little Helper" and its refrain, "What a drag it is getting old," or The Who's "My Generation" – "I hope I die before I get old" – celebrated artists across the age spectrum at the 2015 Grammy show.…

And the Grammys didn't stop with recognition of performers from a wide age range. Like a handful of leading companies in the U.S. and aging societies that realize the potential of intergenerational teams, the Grammys featured intergenerational artist matchups: Tony Bennett and Lady Gaga; Herbie Hancock, John Mayer, Questlove and Ed Sheeran; Jessie J and Tom Jones, and Paul McCartney, Rihanna and Kanye West. When 24-year-old millennial, Hozier, and 60-year-old powerhouse Eurythmics veteran Annie Lennox took the stage, the crowd — and the Internet — went wild. If intergenerational models can work so well in the music industry, they can certainly work in technology, manufacturing, healthcare, education and in many other domains.… —*Paul H. Irving*

Hate to See You Go

[After] nearly six years at the helm of the U.S. Food and Drug Administration, Commissioner Margaret Hamburg, … the long-time public health official, champion of patients and friend of FasterCures, will be stepping down.…

Under Hamburg's leadership, the FDA has evolved into a more transparent, communi-

cative agency that brings external stakeholders to the table earlier and more often. Among her many contributions are the launch of the FDA's Advancing Regulatory Science initiative in 2010 (which developed better tools and standards for assessing safety and efficacy), the increased communication and collaboration between FDA and NIH, the launch of the PDUFA V-initiated Patient-Focused Drug Development Initiative (which invites patients to share their feedback on benefits and risks with the FDA) and multiple measures to speed the development and review of new drugs and devices.… Last year the FDA approved 41 new therapies, the most in almost 20 years, a testament to the impact of these efforts.… *—Margaret Anderson*

Rate Squeeze

Fed Fund futures markets and Fedspeak soothsayers agree that the Federal Reserve will, more likely than not, finally raise short-term interest rates by October.… U.S. banks have been preparing for the Fed's move for some time. The question of whether higher interest rates are good for the banking sector depends on a couple of more specific inquiries: which rates are rising and why?

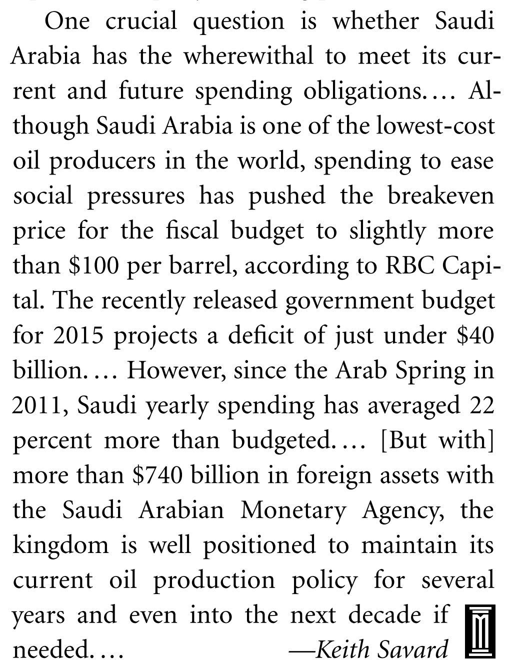
The distinction is important because banks rely on borrowing at cheap, short-term rates and lending money for longer periods at higher interest rates, generating a nice net interest margin (NIM). But troublingly, while short-term rates have risen in anticipation of Fed tightening, longer-term yields have reversed course and fallen in recent months.… This relative flattening of the yield curve bodes poorly for bank NIMs, which already registered record lows in the fourth quarter of 2014. Since 2010, net interest margins have come down substantially for U.S. banks, especially among the largest. Wells Fargo's 12-month trailing NIM dropped from 4.2 percent at the end of 2010 to its lowest-ever recorded, 3 percent, at the end of 2014. In the same period, JPMorgan's fell from 3.1 percent to 2.1 percent… *—Donald Markwardt*

Plus Ça Change

The elevation of 79-year-old Crown Prince Salman as the new regent of Saudi Arabia, following the death of King Abdullah last week, has raised questions in the world's corridors of power. Will policy changes be forthcoming and, if so, when? …

In contrast to past episodes of price weakness when the Saudis expressed a commitment to reduce production, this time their decision has been to maintain market share, at least so far. While there has been much speculation about the Saudis' motivation … they see limited options to reverse market dynamics until marginal producers face the squeeze of rapidly declining prices.

One crucial question is whether Saudi Arabia has the wherewithal to meet its current and future spending obligations.… Although Saudi Arabia is one of the lowest-cost oil producers in the world, spending to ease social pressures has pushed the breakeven price for the fiscal budget to slightly more than $100 per barrel, according to RBC Capital. The recently released government budget for 2015 projects a deficit of just under $40 billion.… However, since the Arab Spring in 2011, Saudi yearly spending has averaged 22 percent more than budgeted.… [But with] more than $740 billion in foreign assets with the Saudi Arabian Monetary Agency, the kingdom is well positioned to maintain its current oil production policy for several years and even into the next decade if needed.… *—Keith Savard*



DESPERATELY SEEKING BIPARTISANSHIP

Patients are pressing for more opportunity to shape the government's medical R&D policy – and the effort is getting a boost from the Institute's FasterCures group, both on Capitol Hill and off. Comments and proposals from FasterCures have been influential in the draft language of 21st Century Cures, the comprehensive assessment of R&D methods and priorities in the House, as well as in the recent "Innovation for Healthier Americans" report in the Senate. FasterCures works with patient organizations across the country, along with both sides of the aisle in Congress. For instance, Fred Upton, the Republican chair of the House Energy and Commerce Committee, and Diana Degette, the ranking Democrat, who are pushing through the 21st Century Cures initiative, shared a platform at our Partnering for Cures meeting in New York last year. Like the Institute, they're trying to make a difference in a hyper-partisan environment.

BOOMTOWNS

"Cities that can create jobs and attract human capital are the most vibrant cities in the long haul," noted Chief Research Officer Ross DeVol, on the occasion of the release of the 15th edition of the Institute's closely watched Best Performing Cities index. This year's top town? For the first time, it's San Francisco, which has been borne aloft by its prowess in technology. Three other tech-heavy towns, Austin, Provo and San Jose, also made the top five.

At an event in San Francisco unveiling the index, Mayor Edwin Lee cautioned that "the talent we've attracted will not stay here unless San Francisco remains an innovative, diverse city." But Hizzoner also promised, "We're going to make sure that the residents benefit from our booming city, and we're showing that you can have a booming city and social commitment." The full report – along with the data detailing how your city ranks and why – can be found at best-cities.org.

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KERN ROCKS

As the rankings of San Francisco and San Jose show, rumors of the hostility of California toward business have been greatly exaggerated. But there's no doubt that the state's regulatory environment can be a tough slog. Kern County, for its part, has been playing against type, pioneering a streamlined planning and permitting process that is fueling job growth well above the averages for both California and the nation. In a recent report, "An Economic Road Map for Kern County," Institute economists delved into what's worked for Kern, and how it can best continue its growth trajectory. Check it out on the Institute's website, milkeninstitute.org.

Russia by the Numbers

The bear is restless again. But some fundamental realities haven't changed. Russia is startlingly poor compared to Germany and the United States – or, for that matter, South Korea or the Czech Republic. And it is startlingly dependent on windfalls from natural-resource sales to pay the bills. That's not likely to change soon: thanks to corruption, horrible winters and lousy infrastructure, doing business is difficult. Meanwhile, income and wealth distribution are wildly unequal, with the consequences reflected in the wretched social stats.

The other reality that hasn't changed, alas, is the Kremlin's disinclination to play nice with its neighbors. And while the economic underpinnings of Russia's ability to project power beyond its borders are frail, they are more than adequate to allow it to cast a long shadow over Ukraine (and Georgia, Belarus, Moldova, Azerbaijan, Kazakhstan and the Baltics). Plus ça change…

	RUSSIA	GERMANY	UNITED STATES
Population (millions, 2014)	141	82	319
GDP ($ trillions, purchasing power, 2013)	$2.55	$3.23	$16.72
GDP per Person (purchasing power, 2013)	$18,100	$39,500	$52,800
Natural Resource Rents (% of GDP, 2012)	18.7%	0.2%	1.3%
Ease of Doing Business (rank out of 189)	62	14	7
Total Fertility Rate (children per women, 2014)	1.61	1.43	2.01
Life Expectancy at Birth (years, 2014)	70.2	80.4	79.6
Healthcare Expenditures (% of GDP, 2011)	6.2%	11.1%	17.9%
Income Inequality (Gini index)	42 (2012)	27 (2006)	45 (2007)
Military Expenditures (% of GDP, 2012)	4.5%	1.4%	4.4%

SOURCES: CIA Factbook; World Bank.

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